Motivation to Participate in Health Advocacy and Health Services: An evaluation of Advocacy for Better Health

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Abstract

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This study utilized the theory of planned behavior to investigate motivations for participating in health advocacy initiatives in Uganda. This study sought to uncover *why* participants choose to engage in health systems advocacy to evaluate the Advocacy for Better Health intervention. A household survey was administered to 946 respondents to capture norms, attitudes, and perceived behavioral control around health services and health advocacy. An exploratory factor analysis identified four latent factors: knowledge of health rights and responsibilities, perception of self-efficacy for health systems change, perception of quality of health facility services, and trust in medical system. In keeping with the Advocacy for Better Health theory of change, logistic regression showed increased odds of participation in advocacy associated with unit increases in knowledge of health rights and responsibilities and unit increases in perception of self-efficacy. Qualitative focus groups and key informant interviews validated these latent constructs. The implication is that efforts to engage citizens in health advocacy for health systems accountability should emphasize knowledge of rights and self-efficacy.

Acknowledgements

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Introduction

Uganda has struggled to build a robust health system but has seen some success in recent years with mortality declining from an age-standardized rate of 1,521 deaths per 100,000 population in 1990 to 786 deaths per 100,000 in 2015 (IHME, 2015). Despite these gains, there are still significant health system challenges remaining in Uganda; facilities are plagued by stock-outs of medication, long wait times, and poor adherence to protocols (MOH, 2008). Due to these issues, 10% of patients elect to visit health facilities that are further from their homes (MOH, 2008). The poor patient satisfaction in Uganda suggests that citizens may be less likely to engage the health system, as patients are more likely to access and adhere to care that is perceived as high quality, and patients' perception of care often reflects quality of care (Manary et al, 2013, MOH 2010).

In recent years, the Ugandan government has prioritized bridging these gaps between citizens and the health system by connecting communities and health systems and promoting community engagement to improve care quality (MOH, 2010). To address issues of patient satisfaction and engage citizens, the Ministry of Health (MOH) in 2001 adopted the strategy of establishing health unit management committees (HUMC) and village health teams (VHT) in every village to empower communities to be responsible for their health and to hold facilities accountable (MOH, 2010). However, the establishment of HUMC's and VHT's have occurred in only ~50% of villages by 2010 (MOH, 2010). The persistently low patient satisfaction with health facilities and the lack of widespread community engagement with the health system reflects a gap in quality healthcare as well as a gap in community engagement with healthcare.

To meet this need to engage citizens, USAID funded the Advocacy for Better Health (ABH) program, a five-year project from 2014 to 2019 implemented by PATH, an international nonprofit organization that creates global health innovations for global impact. The goal of ABH is to galvanize Ugandan civil society organizations (CSOs) and citizens with the skills, tools, and systems to more effectively advocate for accessible, high-quality health services. ABH focuses on strengthening platforms for civic engagement around health services to create effective advocacy driven by community demand. ABH also seeks to enhance the capacity of CSOs and citizens to carry out effective advocacy to improve health services.

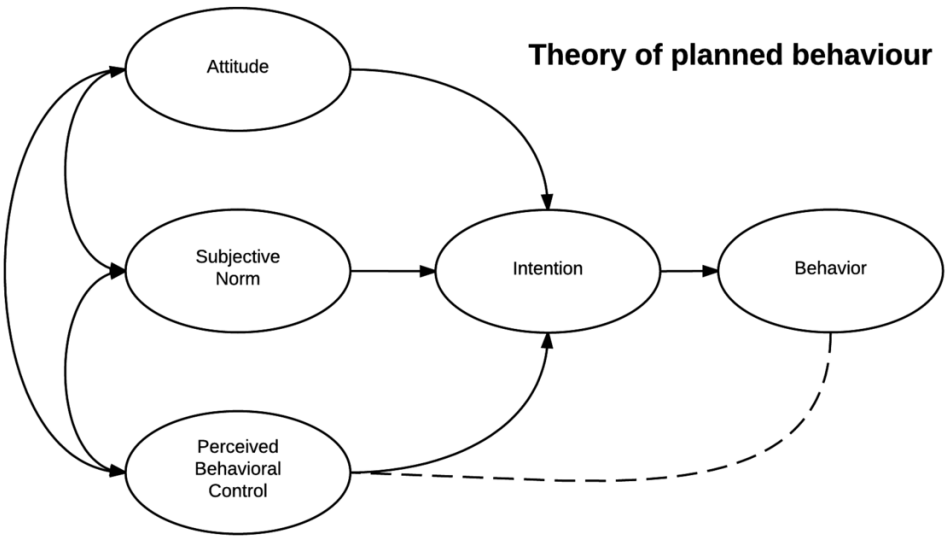
This thesis focuses on understanding the mechanisms through which ABH works by examining *why* individuals chose to engage with the ABH program and with health services to help understand what factors may promote or hinder the success of the intervention. Two main research questions are explored:

1. What factors inform citizens' decisions to engage with the ABH advocacy initiative?
2. What factors inform citizens' decisions to engage with the health system?

Through these questions, we identify obstacle or opportunities on the patient demand side and identify elements that could be further addressed by ABH to increase uptake of advocacy and impact health systems quality.

In evaluating these questions, we apply Ajzen's Theory of Planned Behavior (Figure 1), which posits that behavior is the product of three elements: 1) individual attitudes towards the behavior, 2) subjective norms, and 3) perceived behavioral control, which then leads to intention to act, and subsequently, the behavior itself (1991). In the case of ABH, we presume that these same elements are crucial in shaping participation in advocacy, as advocacy is highly visible and impacts the community. As such, attitudes and community norms are particularly salient when informing the decision to engage in advocacy initiatives.

Figure 1. Theory of Planned Behavior



Azjen's Theory of Planned Behavior was utilized to assess the factors that inform participation in ABH and health services (1991). In addition to demographic factors, these three components were evaluated to understand what shapes participation in ABH and seeking usage of health services.

Methods

This study uses a mixed-methods approach, which leverages household survey data, and qualitative key informant interviews and focus group discussions to assess the key factors in participation in ABH and individual engagement with the health system.

Data was collected as part of the ABH USAID midline evaluation in July 2017; further analysis of the midline evaluation data was done to examine how the components of planned behavior inform the motivations to participate in ABH.

Intervention

To empower Uganda CSO's and citizens with the skills, tools, and systems to effectively advocate for accessible, high-quality health services, ABH mobilizes citizens to become health

advocates through existing community groups and structures. ABH supports groups in identifying community needs and developing advocacy action plans, and where necessary, expanding, reviving, or establishing mechanisms for citizen engagement at the health facility, village, and district levels. ABH connects citizens to duty bearers (local elected and appointed officials) through already existing mechanisms (such as VHT's or HUMC's) and hosts advocacy forums to bring together communities and duty bearers.

These activities are targeted to all citizens (men, women, and youth) within 35 program districts (Annex 1). Educating citizens on their rights and responsibilities and building CSO capacity is done by ABH nationally, while community mobilization and community advocacy are implemented through local partner CSO's. CSO's work with community groups to meet regularly, determine the advocacy issues and then develop advocacy plans and contact duty bearers accordingly.

Study Setting

Data collection was conducted in 10 out of 35 randomly selected project districts where ABH activities occur: Bukwo, Busia, Bushenyi, Isingiro, Kabale, Kalangala, Kaliro, Kasese, Kumi, and Luwero. Within these districts, 86 villages were randomly sampled for data collection, using a multi-stage cluster sampling technique to provide representation proportionate to population size.

Study Subjects

1,276 respondents were randomly selected for the household survey, reflecting a 99% response rate of the targeted 1,289 sample. Respondents were eligible to participate in the household survey if they were 10 years or older, consented to participate in the interview, and represented one of the following eligible populations:

1. Men (15-54): Any male person aged 15 and above and has a living in partner/has an active reproductive life
2. Women (15-49): Any female person aged 15 and above and has a living in partner/has an active reproductive life.
3. Youth (15-24): Any male or female person aged 15-24 years and has neither a living in partner nor an active reproductive life.
4. Orphans and Vulnerable Children (OVC) (10-14): OVC is any person below the age of 14 years who is in a state of being or likely to be in a risky situation, where a person is likely to suffer significant physical, emotional or mental harm that may result in their human rights not being fulfilled.

While the full study sample of 1,276 respondents was used in the mid-term program evaluation the analysis was performed only on adult participants over age 18. The total number of respondents for this study was 946.

98 participants were purposively recruited for focus group discussions. Focus groups were conducted with the same populations of respondents: male citizens, female citizens, and youth citizens 18-24. Focus groups for each population were conducted in the Eastern region, the Western region, and the Central region. Table 1 shows the breakdown of participants from each group.

Table 1. Focus Group Discuss Participant Sample

Participant Group	Number of Respondents
Men	32
Women	31
Youth	35

Eligibility for the household survey and focus groups were not restricted to citizens who had participated in ABH program activities; all citizens living within ABH catchment areas were eligible for participation.

33 key informants were purposively selected for interview, based upon their understanding of health and social service delivery and community empowerment mechanisms that could inform Advocacy for Better Health in improving program strategy. Table 2 shows the types of key informants selected for interview:

Table 2. Key Informant Interview Participant Sample

Type of Respondent	Number of Respondents
National-level CSO's	2
National-level duty bearers	1
District-level CSO's	7
District-level duty bearers	9
Implementing partners	3
Health facility staff	7
ABH staff	4

Data Collection

Collection of the household survey data was undertaken by trained data collectors with knowledge of both local and English languages, familiarity with the study districts, and experience in social research methods. During data collection, on entry into the household, data collectors introduced themselves and obtained verbal consent from the respondents.

The household questionnaire tool captured information on 1) respondent's knowledge of individual rights and responsibilities related to health and social services; 2) level of involvement of the respondent in planning, monitoring and holding accountable health and social services in

the past year; and 3) the involvement of respondent in demanding for improved quality of health and social services in the past year. The questions included in household questionnaire have been adapted from earlier validated studies such as citizen satisfaction surveys and the Afrobarometer to enlist information required on citizens' perception, attitudes and practice (Afrobarometer, 2011). For the household survey, data entry screens in EPIDATA software were utilized with validation checks to minimize errors that could be introduced at the stage of data entry. To ensure data quality, supervisors also reviewed filled questionnaires at the end of each day to check for completeness of responses.

Focus group discussions were organized by local CSO's, who recruited local members and established a venue. The focus group discussions were conducted by data collectors with knowledge of both local and English languages, familiarity with study districts, and experience with qualitative research. Two data collectors were present for each focus group; one data collector acted as a facilitator, and the other as a notetaker. Focus groups were facilitated using semi-structure interview guides developed for ABH. Audio recording and notetaking was used to document focus group discussions, and then transcripts were typed into a word processing software.

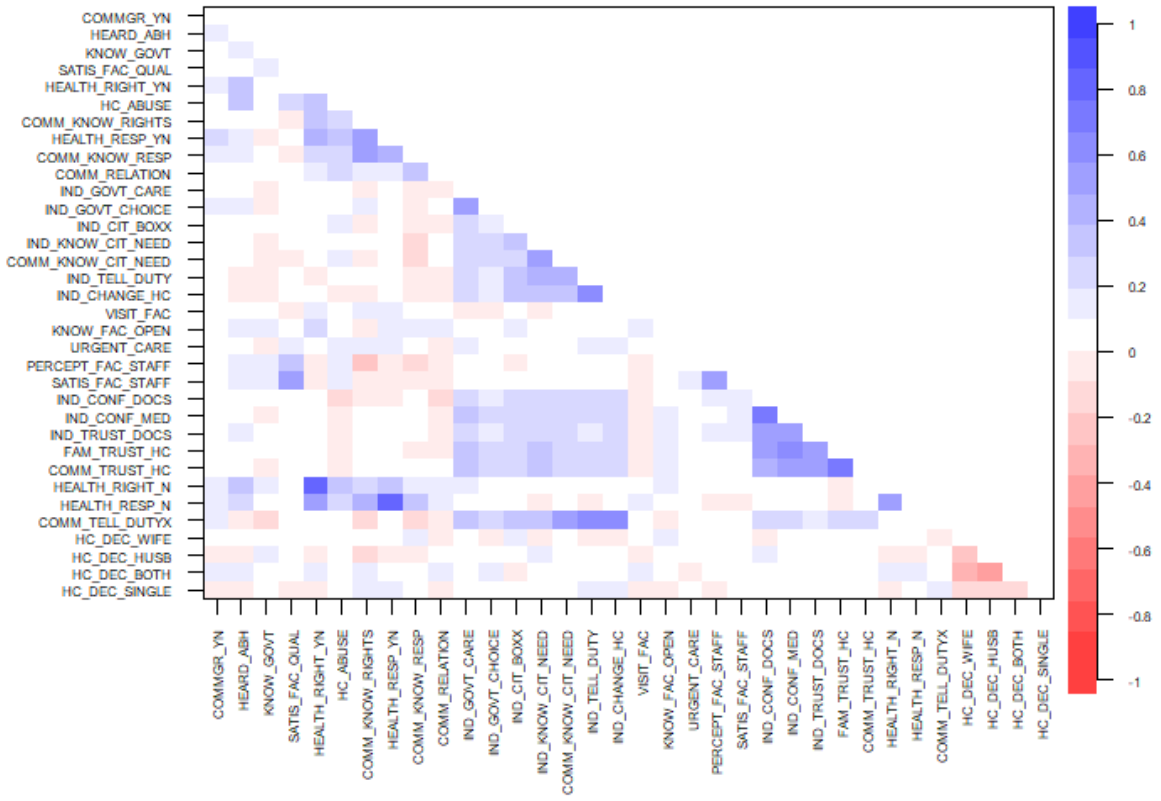
Key informant interviews were conducted by Advocacy for Better Health program staff, using a semi-structured interview guide with in-person interviews. Audio recording or notetaking was used to document focus interviews, and notes and transcripts were typed into a word processing software for analysis.

Analysis

Analysis was undertaken for each of the research questions using a mixed methods approach; household survey data was used for quantitative factor analysis, and FGD and KII data were used for a qualitative analysis which contextualized the findings observed in the quantitative analysis. Additionally, descriptive statistics about the level of participation in ABH and level of use of health services were reported.

To initially assess and reduce the factors that shape participation, exploratory factor analysis was conducted using household survey data. Exploratory factor analysis was chosen to identify a smaller number of key factors that shape participation as we expected there would be common "themes" or attitudes that may be collectively captured by several survey questions. Due to the large number of questions that are associated with individual perceptions, community norms, and behavioral control characteristics on the survey, it was not expected that any single question adequately captured these attitudes; instead the latent factors were desired. Furthermore, a simple regression analysis is prone to return an "alphabet soup" of findings, without first appropriate reduction to isolate key factors. A correlation matrix of selected survey variables confirms that multiple survey variables are highly correlated, indicating "as-is" regression would be ineffective and factor analysis was suited to the data to uncover the latent factors (Figure 2).

Figure 2. Correlation of selected survey variables



Outcome Variables

In this analysis, participation in ABH was measured using three distinct participation variables: 1) participation in a community planning meeting where the respondent has advocated for improved quality of health and social services in the past year; 2) have contacted a duty bearer about the quality of health services in the past year; and 3) participation in a meeting or event where citizens and duty bearers have come together to discuss health issues effecting the people. Usage of health services was measured as having visited a health facility within the past year. Analysis was done for each of the identified outcome variables independently. Table 3 shows the full list of variables for reduction via factor analysis, categorized by area of the conceptual model. Demographics were omitted from the factor analysis as they do not measure latent groupings of norms, attitudes, or knowledge. Dimensions identified in the factor analysis were rotated to generate simplified factors for inclusion in the multiple logistic regression.

Table 3. Variables to be reduced through factor analysis

Category of variable	Variable
Perceived behavioral control	○ Knowledge of facility services ○ Urgency of need for medical care

Category of variable	Variable
	○ Having heard an ABH advocacy message in the past year ○ Awareness of local government activities in area of residence ○ Decision making power about health care
Attitudes and knowledge	○ Knowledge of health rights ○ Knowledge of health responsibilities ○ Experience of having your health rights abused ○ Experience of visiting a health facility within the past year ○ Attitude that respondent knows what citizens need from the govt. ○ Attitude that respondent has the right to tell duty bearers what is needed ○ Attitude that respondent can make changes to services ○ Perception of medical staff at the nearest health facility ○ Satisfaction with relationship between community and health facility staff ○ Satisfaction level with quality of health services offered ○ Confidence in doctors ○ Confidence in medicine ○ Trust in doctors' care for patients
Community norms and beliefs	○ Opinion that community know their health rights ○ Opinion that community know their health responsibilities ○ Opinion of community relationship to health and social services (recipient vs partner) ○ Opinion that community knows what citizens need from govt. ○ Opinion that community would tell duty bearers what is needed ○ Belief statement of citizens being like children, cared for by govt. ○ Belief statement of govt. being like a parent, making good choices ○ Belief statement of govt. being like employee, citizens are bosses ○ Family trust in healthcare ○ Friends trust in healthcare

Multiple logistic regression was used to assess the influence of identified factors on each binary participation outcome individually and the health services engagement outcome. The participation outcomes were used as the dependent outcome, and the variables identified in the exploratory factor analysis were included as the independent variables. Demographic variables were included in the regression analysis (Table 4). All variables were included simultaneously.

Table 4. Demographic variables included in logistic regression

Category of variable	Variable
Demographic characteristics	○ Age ○ Sex ○ Highest level of education completed ▪ No education; primary; ordinary; advanced; tertiary ○ Marital status ▪ Unmarried; married; divorced; widowed ○ Multi-dimensional wealth index ▪ See coding method below on pg. 9 ○ Occupation ▪ Unemployed; subsistence farmer; commercial farmer; fisherman; housewife; laborer; domestic worker; vendor; business owner; professional worker; security personnel; artisan; politician; broker; student

The analysis of the focus group discussion data and the key informant interview data was conducted using thematic analysis. Qualitative data was analyzed via conventional content analysis where codes are derived directly from a review of the text and then utilized to derive themes. The interview guides served as the foundation for the codebooks, supplemented by expected codes from the theory of change and feedback from the ABH program team. The codebooks were continually updated throughout the coding process with codes being added or removed as themes emerged.

Initial cleaning of the household survey data was done in SAS; factor and regression analyses were conducted in R. Focus group discussion and key informant interview transcripts were imported into Atlas.ti and labeled and categorized under themes and sub-themes for analysis.

Results

Sample

Limited data cleaning was undertaken, including coding ‘don’t knows’ as missing values. Three variables (number of health rights known, number of health responsibilities known, and wealth quintiles) were calculated based upon the answers to knowledge of individual health knowledge statements. To calculate the number of health messages known, respondent’s answers were summed across all individual health knowledge statements. If a respondent did not answer the general questions “are you aware of your health rights?” and “are you aware of your health responsibilities?”, answers were imputed based upon the sum of health rights and responsibilities known. To calculate wealth quintiles, an asset-based wealth index was created, using a simplified version of the Demographic Health Survey (DHS) approach developed in partnership with USAID (Equity Tool, 2016). Further information on data cleaning can be found in Annex 2. The

dataset including demographic variables and outcome variables is 45 variables and 946 observations. The sample for inclusion in the factor analysis model is 34 variables and 946 observations, excluding outcome and demographic variables.

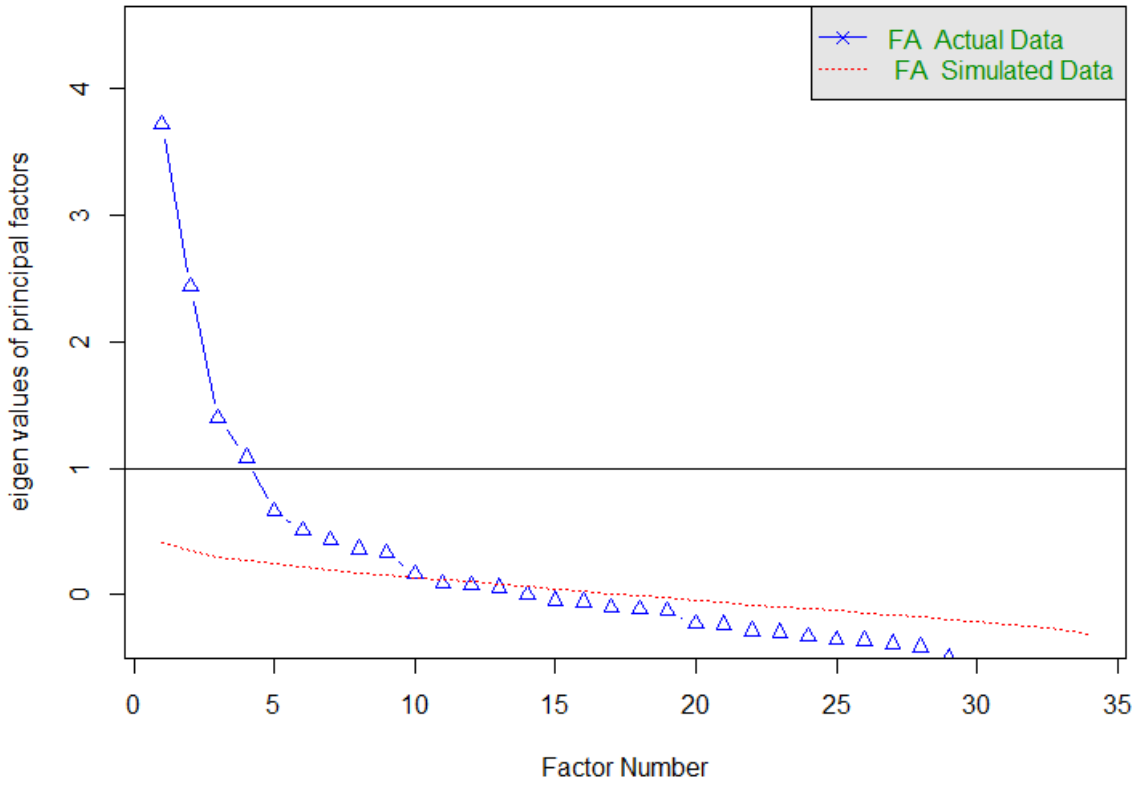
Due to missing values, there are 760 complete non-missing cases present on the dataset. Four variables have rates of missing greater than 15%: 1) experience of abuse at a health facility; 2) opinion that the community knows their health rights; 3) opinion that the community knows their health responsibilities; 4) opinion of community relationship to health services. The remaining missing values are randomly distributed amongst all variables and all cases. Further description of the distribution of missing values can be found in Annex 3. To assess the pattern of missingness, Littles' test for Missing Completely At Random (MCAR) was run and rejected at the 0.05 significance level (Little and Rubin, 2014). Examination of the four variables with high rates of missingness used t-tests to compare the missing and non-missing data groups and confirm that the data is not Missing Not At Random (MNAR); thus, the data is presumed to be Missing At Random (MAR). That is, missing observations are a product of the observed data, and an increased or decreased likelihood that certain subsets of the population will answer the selected questions. For instance, people who are more embedded in community are more likely to answer questions on community opinions.

To address the MAR data, multiple imputation was conducted to generate imputed values for all missing observations (Honaker et al, 2011; Little and Rubin, 2014). Uncertainty from imputation was propagated into the results through the imputation package used (Honaker et al, 2011). All 946 observations with imputations are included in the factor analysis.

Factor Analysis Model

To determine the appropriate number of factors for the model, a scree plot was run (Figure 3). The number of factors was selected based upon the number of factors with an Eigenvalue greater than 1, which indicates more variance is explained than with a single variable [1 is considered a standard threshold, as it would indicate a single variable could explain more variance] (Kim and Mueller, 1978). The scree plot indicates that the optimal n of factors is 4, from a reduction of 34 variables.

Figure 3. Parallel Analysis Scree Plot to Determine N Factors



The correlation matrix for the factor analysis was run using Pearson coefficient (Figure 2). The Pearson coefficient was selected because of the predominance of Likert-type scale questions. While there has been much debate around the appropriacy of parametric measures with ordinal Likert-type data, evidence supports the position that Likert scales capture underlying intervals, and the review of the survey questions evidence an underlying normal distribution (see Annex 4 for histograms of variables) (Carifio and Perla, 2008; Norman, 2010). Because of the interval nature of the Likert-type scales and the variable distributions, the use of the Pearson coefficient is appropriate in a social science factor analysis. The factor analysis model was run using minimal residual factor extraction and an oblique (oblimin) rotation. An oblique rotation was chosen as it allows factors to be correlated with one another; we would expect that some factors may be correlated (Kim and Mueller, 1978). For instance, we could reasonably expect that community norms may be correlated with individual attitudes as an individual's views are shaped by the community in which they are situated. The substantive difference in the use of an oblimin rotation is that factor loadings are presented using loadings from the pattern matrix in lieu of loadings from the reference axes (Kim and Mueller, 1978; Costello and Osborne, 2005; Gorsuch, 2015). Interpretation of the pattern matrix is not substantively different, though significant correlation among factors may require assumption of higher-order factor causation to explain correlations (Kim and Mueller, 1978; Costello and Osborne, 2005; Gorsuch, 2015). The

factor analysis model was fit for four factors, as determined by the scree plot above (Figure 3). The factor analysis diagram is determined to have the four following factors (Figure 4):

1. Knowledge of health rights and responsibilities
2. Trust in medical systems
3. Self-efficacy for health systems change
4. Perception of quality of health facility services

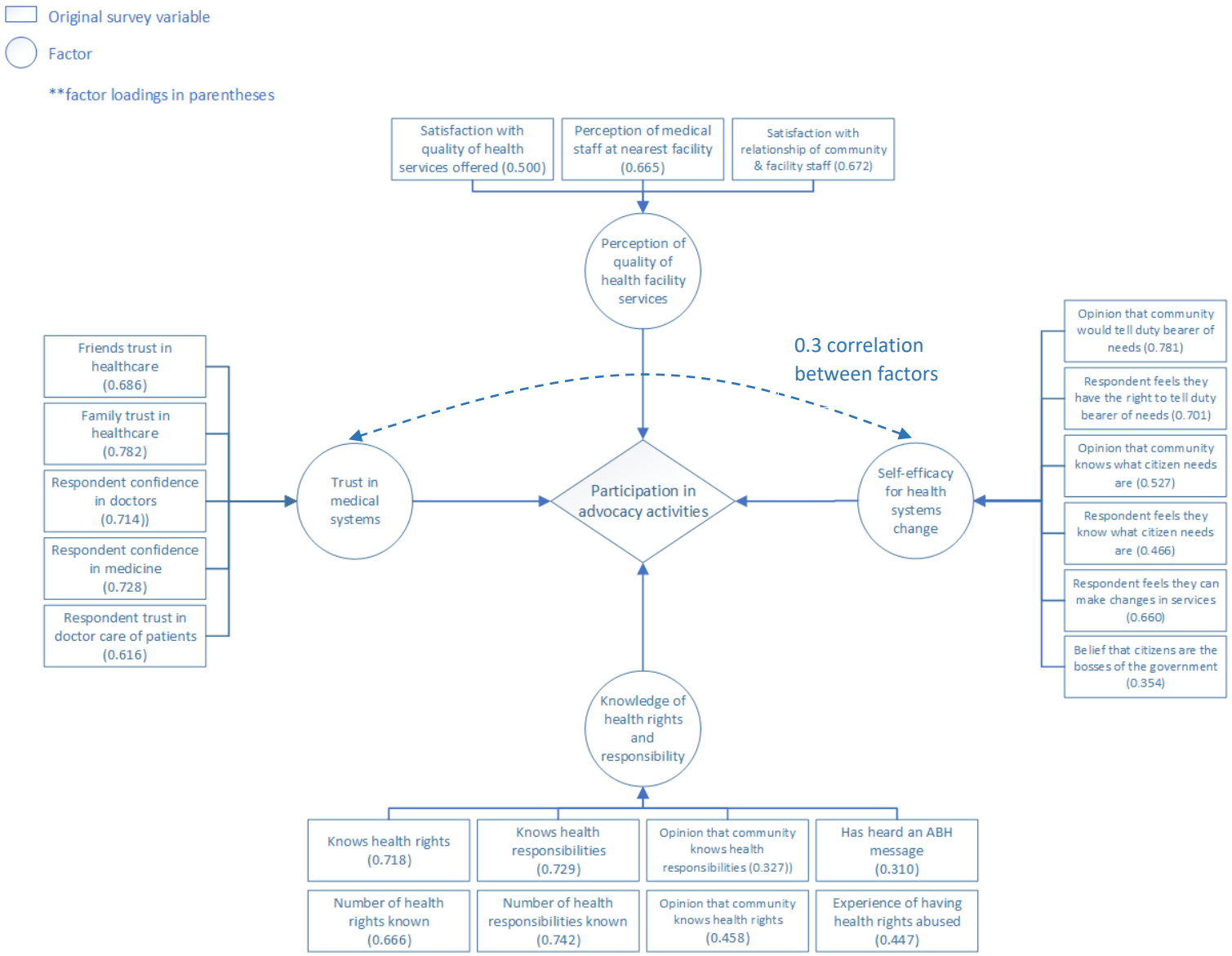
To aid in the interpretation of each factor, we identify what a "high" value and a "low" value on the factor indicates, based upon the coding schema used in the component survey variables:

Table 5. Scale of Factor Scores

Factor Identified	Low value	High value
Knowledge of health rights and responsibilities	Does not know rights	Knows rights
Trust in medical systems	High degree of trust	Low degree of trust
Self-efficacy for health systems change	High degree of efficacy	Low degree of efficacy
Perception of quality of health facility services	Good quality facility	Low quality facility

The full table of factor loadings can be seen in Annex 5.

Figure 4. Factor Analysis Diagram



We examine the identified factors in the context of the three components of Ajzen's Theory of Planned Behavior: 1) individual attitudes, 2) subjective norms, and 3) perceived behavioral control. These components ostensibly lead to intention to act, and subsequently, the behavior itself. Two of the identified factors fall clearly into the *individual attitudes and knowledge* component of Ajzen's framework: 1) knowledge of health rights and responsibilities and; 4) perception of quality of health facility services. These both reflect primarily personal experiences and understanding of health rights and facility services.

While knowledge of health rights and responsibilities is primarily individual attitudes, it does include subjective norms such as 'opinion that community knows health rights' and 'opinion that community knows health responsibilities', indicating that the knowledge of people around you also influence individual knowledge of health rights and responsibilities. The knowledge factor also loads with 'heard an Advocacy for Better Health message', which indicates having heard an educational ABH message on health rights and responsibilities of the citizen. Thus, this loading is indicative of health knowledge exposure, as it indicates that a respondent has been exposed to ABH educational materials on health rights. Knowledge of health rights and responsibilities also includes the survey indicator for an experience of health rights abuse. While this is seemingly oppositional to knowledge of health rights, we posit that it loads in the knowledge of health rights factor due to the expected correlation between knowledge and abuse. That is, if you know your health rights, you are better able to name health rights abuse and are thus likelier to say when your rights have been abused.

Interestingly, the remaining two factors are a mix of *norms* and *individual attitudes.* In the case of the factors 2) self-efficacy for health systems change and 3) trust in medical systems, the delineation of norms and attitudes is less important than the content of the belief itself. These belief factors encompass both community norms (such as, 'my community knows what health services are needed') and individual attitudes (such as, 'I know what health services are needed'). We posit that this may be a product of more collectivist societal attitudes that reflect a high-context culture that does not neatly align with Ajzen's framework. As there is a less clear emphasis on the individual in these high-context settings, information gathering, and processing is a more communal experience (Hall and Hall, 2001). In contrast, low-context Western cultures (upon which Ajzen's framework was developed), tend to be more individualistic with individual information gathering and decision making (Hall and Hall, 2001). Critical assessment of behavioral theories similarly argue that these behavioral models are often Western constructs that do not translate cross-culturally, though researchers have argued that this is a measurement failure in appropriately understanding and eliciting beliefs from study populations (Glanz, 2015).

Variables representing p*erceived behavioral control* from Ajzen's framework do not significantly load in any of the factors. Knowledge of duty bearers, control over health decisions, or knowledge of local facilities is not nearly as prominent as norms and attitudes around health. To assess whether this is a limitation of the survey questions or the factor model, we attempt inclusion of the locus of control factors in the logistic regression model; none are statistically

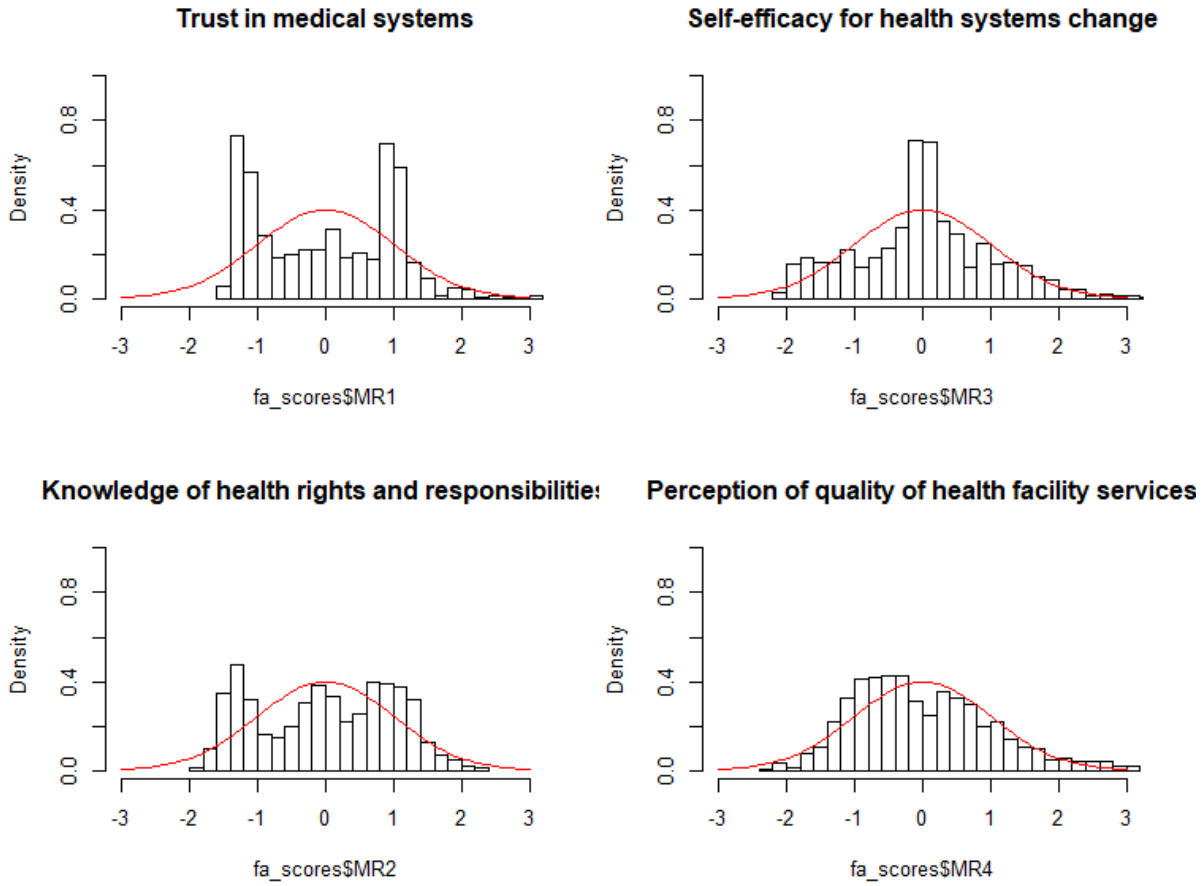
significant. Two competing hypotheses exist for this observation. Further work on the Theory of Planned Behavior has identified two distinct components of *perceived behavioral control*: external controllability and internal control factors (Ajzen ,2002). While the survey questions themselves represent norms and beliefs, the factor self-efficacy for health systems change is representative of internal control perceptions. Thus, external controllability may be relatively unimportant in advocacy decisions, while internal controllability is. Alternatively, we posit that the relative unimportance of *perceived behavioral control* is instead particular to decision making for advocacy and activism. Other studies examining activism actions with the Theory of Planned Behavior Framework have similarly found that norms and beliefs are the most important drivers of advocacy action (Kelly and Breinlinger, 1995; Fox-Cardamone et al, 2010).

We also observe a 0.3 correlation between the factors of self-efficacy for systems change and trust in medical systems. This may be indicative of a higher-order factor that explains the correlation between the two factors. For example, a higher order factor of trust in political governance systems broadly could underpin both self-efficacy for systems change and trust in medical systems. That is, a person who does not trust the governance system is less likely to both trust the medical system and believe in the capacity for citizen change of the medical system. We do not investigate higher-order factors at this time.

Multiple Logistic Regression Model

Factor scores are calculated for each of the above four factors using ven Berge methodology, which weights predictors and accounts for the correlation between factors, making it an appropriate choice for use with an oblique rotation (Grice and Appelbaum, 2001). The distribution of each of the calculated factor scores can be seen in Figure 5. All distributions are normal, except for 1) trust in medical systems, which has a bimodal distribution and 2) knowledge of health rights and responsibilities. The bimodal distribution of trust in medical systems indicates that most respondents tended to be very confident in medical systems or had very little confidence in medical systems; few respondents were neutral in their trust of medical systems. The non-normal distribution of knowledge of health rights and responsibilities is reflective of the wider variation in knowledge levels.

Figure 5. Distribution of Factor Analysis Scores



Decision to Engage with Advocacy Initiatives

Multiple logistic regression was run with the four factor scores above, and the demographic variables identified in Table 3 for each dependent outcome. Missing demographic values and missing outcome data were imputed using the methods outlined above. Table 6 reports the final sample for each logistic regression, as well as the proportion of respondents who reported the outcome and the proportion of imputed responses.

Table 6. Logistic Regression Sample and Proportion with Outcomes

Outcome of interest	N observations	Proportion with observed outcome	Proportion of outcomes with imputation
Participation in a community planning meeting where the respondent demands for improved quality of health and social services	946	20.8%	9.7%
Contacted a duty bearer about the quality of health services in the past year	946	15.4%	0.10%

Participating in a meeting or event where citizens and duty bearers come together to discuss health issues affecting the people	946	17.9%	3.3%

Table 8 reports the coefficients and odds ratio for all logistic regressions; statistical significance is reported at the 5% level. While demographic variables for age, wealth, gender, education, marital status, and occupation are included in the factor analysis, no statistically significant results are reported for marital status, occupation status, or wealth. The goodness of fit of the logistic regression model is assessed using McFadden's pseudo r-squared (Table 7). As with a traditional r-squared, a value of 0 for McFadden's R^2 indicates no variance in the model is explained by the independent variables; a value of 1 indicates all the variance is explained. However, the interpretation of McFadden's R^2 is more generous than the rho-squared in a linear model, due to the considerable lower values observed in the logistic model. In McFadden's r-squared, values of 0.2 to 0.4 represent excellent model fit (Hensher and Stopher, 1979). As such, we observe that our logistic regression models are reasonably well fit with the observed variables.

Table 7. McFadden's pseudo r-squared to assess goodness of fit

Outcome of interest	McFadden's pseudo r-squared
Participation in a community planning meeting where the respondent demands for improved quality of health and social services	0.116
Contacted a duty bearer about the quality of health services in the past year	0.166
Participating in a meeting or event where citizens and duty bearers come together to discuss health issues affecting the people	0.082

Table 8. Logistic Regression Coefficients and Odds Ratios for Engagement with Advocacy Dependent Variables (n = 946)

	Participation in a community planning meeting where the respondent demands for improved health services			Contacted a duty bearer about the quality of health services in the past year			Participation in a meeting where citizens and duty bearers come together to discuss health issues affecting the people		
	Coeffic.	**OR**	**P-value**	**Coeffic.**	**OR**	**P-value**	**Coeffic.**	**OR**	**P-value**
Intercept	-0.4286	0.65	0.330	-0.2365	0.79	0.534	-0.3375	0.71	0.421
Distrust in medical systems	0.0221	1.02	0.115	0.0161	1.02	0.184	0.0136	1.01	0.309
Knowledge of health rights and responsibilities	0.0670	1.07	0.000 ***	0.0769	1.08	0.000 ***	0.0652	1.07	0.000 ***
Lack of self-efficacy for health systems change	-0.0360	0.96	0.010 *	-0.0414	0.96	0.000 ***	-0.0429	0.96	0.001 **
Perception of low quality of health facility	0.0026	1.00	0.845	0.0252	1.03	0.030 *	-0.0041	1.00	0.747
Gender	0.0792	1.08	0.004 **	0.0383	1.04	0.111	-0.0067	0.99	0.801
Age (years)	0.0048	1.00	0.001 **	0.0015	1.00	0.258	0.0020	1.00	0.181
Education	0.0259	1.03	0.157	0.0321	1.03	0.042 *	0.0207	1.02	0.235

*Notes: The model included variables for marital status, occupation status, and wealth; no statistically significant results are reported. Statistical significance is reported at the 5% level; * = < 5%; ** < 1%; *** < .1%.*

The logistic regression results show that the most significant correlate of advocacy participation, across all outcomes, is knowledge of health rights and responsibilities. Holding all else constant, a unit increase in knowledge of health rights and responsibilities leads to 7-9% higher odds of participating in an advocacy activity. This is in line with the ABH theory of change and ABH program activities, which have heavily focused on educating citizens on their health rights, through a charter on patients' rights, radio shows, television spots, and news articles.

The other statistically significant factor associated with advocacy participation across all three participation outcomes is lack of self-efficacy for health systems change. Referencing our factor scales, a low score indicates high self-efficacy. Thus, a unit increase in perception of lack of self-efficacy (e.g. from 1 to 2) leads to a 4-5% decrease in participation. This is also in line with the ABH theory of change and program activities which suppose that citizen empowerment leads to advocacy.

In addition to the factors of self-efficacy and health knowledge which are significant across all three outcomes, there are outcome specific drivers with significance. For participation in a community meeting where you demand for improved health services, age and gender both correspond with participation. A year increase in age leads to a marginally (<1%) greater odds of participation; men have 8% greater odds of participation. Interestingly, participation in a meeting with a duty bearer has no other significant drivers. We posit that this may be the result of the different settings of the two meetings.

Having contacted a duty bearer about the quality of health services in the past year has two further statistically significant determinants: perception of health facility quality and education, which both increase the odds of the outcome 3%. This suggests that respondents tend to contact duty bearers with concerns about health facility quality, and education (for example, the ability to write, or articulate your complaints) enables them to do so. This finding is explored further in the qualitative analysis.

Decision to Engage with Health Services

Multiple logistic regression was run with above factor scores and demographic variables for the outcome 'visited a health facility in the past year'. Table 8 reports the final sample for the regression, with the proportion of observed outcome and imputed responses.

Table 9. Regression Sample and Proportion with Outcomes

Outcome of interest	N observations	Proportion with observed outcome	Proportion of outcomes with imputation
Visited a health facility in the past year	946	75.5%	0.4%

Table 10 reports the coefficients and odds ratio for the regressions; statistical significance is reported at the 5% level. Demographic variables are observed to be statistically significant for

health services engagement and are recorded below. The goodness of fit of the logistic regression model is assessed using McFadden's pseudo r-squared. We observe that the pseudo r-square is 0.087, suggesting the regression model is reasonably well fit, though less robustly than the advocacy model.

Table 10. Logistic Regression Coefficients and Odds Ratios for Engagement with Health Services Dependent Variable (n = 946)

	Visited a health facility in the past year			
	Coeffic.	**OR**	**P-value**	
Intercept	0.5639	1.76	0.218	
Distrust in medical systems	-0.0519	0.95	0.000	***
Knowledge of health rights and responsibilities	0.0353	1.04	0.013	*
Lack of self-efficacy for health systems change	0.0065	1.01	0.656	
Perception of low quality of health facility	-0.0545	0.95	0.000	***
Occupation: Artisan	0.3781	1.46	0.057	
Occupation: Broker	0.4285	1.53	0.029	*
Occupation: Commercial Farmer	0.3935	1.48	0.041	*
Occupation: Domestic worker	0.4682	1.60	0.024	*
Occupation: Fisher	0.6011	1.82	0.016	*
Occupation: Housewife	0.3606	1.43	0.064	
Occupation: Laborer	0.2993	1.35	0.131	
Occupation: Other	0.4553	1.58	0.032	*
Occupation: Owner	0.3643	1.44	0.079	
Occupation: Politician	0.3504	1.42	0.249	
Occupation: Professional	0.2909	1.34	0.153	
Occupation: Security forces	0.6129	1.85	0.020	*
Occupation: Student	0.4572	1.58	0.026	*
Occupation: Subsistence Farmer	0.4305	1.54	0.021	*
Occupation: Unemployed	0.3231	1.38	0.100	
Occupation: Vendor	0.2571	1.29	0.180	

*Notes: The model included variables for marital status, education status, age, gender and wealth; no statistically significant results are reported. Statistical significance is reported at the 5% level; * = < 5%; ** < 1%; *** < .1%.*

As expected, distrust in medical systems and perception of poor health-systems quality are both statistically significant in the decision to seek medical care at a facility. A unit increase in either factor (indicating decreasing trust and decreasing facility quality), leads to a 6% decrease in the odds of having visited a facility. Interestingly, a unit increase in knowledge of rights and responsibilities is associated with a statistically significant 4% increase in the odds of using health services, suggesting that knowledge of health responsibilities correlates with accessing services.

Qualitative Analysis

The qualitative analysis validates the definition of two of the latent factor constructs identified and lends context to the effects shown in the logistic results: knowledge of health rights and responsibilities and self-efficacy for health systems change. The qualitative analysis further lends context to the logistic regression results on the effect of health facility quality on contacting a duty bearer.

Knowledge of Rights and Responsibilities

Key informant interviews identified citizen knowledge as a primary factor in advocacy participation, and that increases in citizens knowledge led to subsequent advocacy engagement. While the quantitative results can't determine causality, the qualitative results do provide evidence supporting the concept that improvements in citizen knowledge of health rights leads to an increased likelihood of advocacy engagement. District-level duty bearers and health facility staff named knowledge acquisition on health as one of the important benefits of the ABH program. In keeping with the effect observed, CSO's and district-level duty bearers perceived that this increase in knowledge and engagement culminated in increased citizen demand for services, as they were made aware of their rights and responsibilities:

> *The public was kind of sleeping. They did not know that demanding for what, for their rights, that you demand for it. […] But now they know that it is in their power to have these services and to push for them even when their services are there, to push for the better service delivery. That was not there before. And to me, that is one of the biggest things that has been done.*
>
> - Executive Director, District-level CSO, July 2017

Duty bearers also voiced that community members were driven by knowledge of their rights to speak up:

> *Yes, because they have improved even the demand for services by the community. Because they open up their mind of their rights. The right to have access to quality health services. And people end up saying – can you have a health centre here? Can the government construct a maternity ward here? Eh, why aren't we getting ARV's in time? Because of that.*
>
> - District Health Officer, July 2017

Perception of Self-Efficacy for Health Systems Change

One of the other benefits identified by key informants was improved citizen confidence in their ability to speak to duty bearers. This concept of citizen confidence or self-efficacy as a driver in contacting duty-bearers is aligned with the factors identified above. Again, the quantitative results do not denote causality, but the qualitative research suggests increased self-efficacy for systems change has a positive effect on participation in advocacy. Some CSO's described engagement as

a product of improved citizen confidence in their ability to speak to duty bearers or to use their voices, in line with the effect of self-efficacy for systems change observed in the logistic regression:

> *I think to me, the biggest success which I am seeing is citizens getting confidence in interfacing with duty bearers and telling them exactly what is affecting them and coming out with action of this is what we want.*
> - Executive Director, District-level CSO, July 2017

There were negligible focus group respondents who had participated in advocacy programs, so it was not possible to verify if focus groups respondents similarly felt driven by self-efficacy, though many respondents cited a lack of self-efficacy as a reason they did *not* engage with duty bearers, describing their lack of influence over their community leaders. One focus group respondent described it as such:

> *You see, these leaders we elect, they only use us as ladders and once they reach up, they forget all about us. What else can we do? Nothing.*
> - Men's FGD Participant, August 2017

Other respondents described the lack of self-efficacy for change in terms of having no authority on health issues in their community and perceiving all health decisions to be the control of the local government only. One member described it as such:

> *We do not have the authority and we can't do anything. For example there is a time where the chairman got angry and beat up the health workers in the health facility so the health workers decided to strike.*
> - Men's FGD Participant, August 2017

These descriptions align with the factor perceptions of self-efficacy, which included variables such as being able to tell duty bearers of the community's needs and feeling like they knew what their community needed. These qualitative findings further buttress the positive effect that self-efficacy has on advocacy participation, and conversely, the negative effect that a lack of self-efficacy for systems change has on participation in advocacy.

Perception of Health Facility Quality

Key informants detailed several complaints which citizens raised to duty bearers, frequently around the issue of perceived facility quality. These contacts with duty bearers, and subsequent changes, were cited as one of the key successes in the ABH program. This is in line with the logistic regression results identified, where a decrease in perceived health facility quality was associated with increased odds of contacting your duty bearer. For example, key informants cited communication with a duty bearer on a health facility issue as:

Then there was another health centre 4 here where a theater had completely, been abandoned. The citizens made noise, there even was a TV story,[…] they pressed the surgeon and they also installed electricity so it now functions.

- Executive Director, District-level CSO, July 2017

This qualitative finding suggests that in particular, individuals are motivated to contact their duty bearer when they have specific, tangible complaints about the quality of their local health facility.

Discussion

This survey data broadly identifies four latent factors: 1) knowledge of health rights and responsibilities; 2) self-efficacy for health systems change; 3) trust in medical systems and; 4) perception of health facility quality. When examining Ajzen's Theory of Planned Behavior, these four factors suggest that *attitudes* and *norms* are the most salient for advocacy, though they are mixed across factors according to the content of the belief; perceived behavioral control does not load onto any factors.

Of these four factors, two are strongly associated with participation in advocacy, with increase in knowledge of health rights and self-efficacy leading to increased odds of advocacy participation. For advocacy specifically targeted at contacting a duty bearer, a decrease in perceived health facility quality is also associated with increased odds of engagement; this is posited to be a result of citizens primarily contacting duty bearers about local facility quality concerns. Key informants and focus group discussants validate these three constructed factors, and their effect on participation in advocacy.

When examining engagement with the health system, trust in medical systems and good perception of facility health quality are most strongly associated with visiting a health facility. As expected, a decrease in facility quality and distrust in the medical system is associated with a decrease in the odds of visiting a health facility.

Strengths and Limitations

The strength of this analysis lies in the mixed method approach, which leverages both quantitative factor analysis and logistic regression analysis in conjunction with a thematic qualitative analysis. The quantitative analysis allows construction of the latent factors through the survey data, and subsequent identification of the factors that are significantly associated with participation in advocacy. The qualitative analysis indicates there may be causality between participation in advocacy and the identified factors. This analysis is further strengthened by the sampling of the citizen population at large, which includes individuals who have *not* participated in ABH program activities, as well as those who have. Because this sample is representative of the larger population and there is adequate variation in the advocacy participation outcomes, the analysis allows us to get a better sense of why (or why not) citizens choose to participate in advocacy.

The analysis is primarily limited by the measurement of behavior change constructs as captured in the survey. Broadly, conceptual concepts such as self-efficacy and behavioral control are

difficult to quantify, and household surveys may not capture the necessary nuance. Furthermore, the primary design of this survey was not to measure behavior change constructs, but to assess progress towards mid-term evaluation targets. As a result, while questions were included on the survey that were informed by behavior change survey instruments, there may be instruments that are better validated or more appropriately designed to measure the behavior change constructs of interest. Design of survey questions (and relatively fewer survey questions) may also contribute to the lack of factor loading for perceived behavioral control; further analysis may reveal survey questions which better capture behavioral control within the context. Finally, the qualitative analysis is limited by the lack of advocacy participants within the focus group discussions. This limits the ability of the qualitative analysis to accurately contextualize the effects of identified factors in contributing to advocacy participation, though the focus group findings are suggestive as a counter-factual.

Implications

The findings suggest that the most salient factors in engaging citizens in advocacy initiatives are individual knowledge of their rights and responsibilities, and perception of their self-efficacy. Firstly, these findings align with the ABH theory of change, indicating theoretical validity of the conceptual framework for the ABH program. This alignment with the ABH conceptual framework also indicates that the strategies and activities undertaken in ABH program implementation are likely aligned with the factors that are associated with health advocacy. The qualitative findings suggest that increasing knowledge of health rights and self-efficacy for systems changes contributes to increased participation in advocacy.

These findings also speak to the importance of demand side interventions to increase citizen engagement in advocacy on health services. While supply side factors are crucial in building a functioning health system, health system building blocks such as leadership and governance, financing, service delivery, and workforce all benefit from increased citizen demand and oversight. Bringing community members, health workers, and duty bearers together creates an environment where citizens can communicate their health needs and improve accountability of the health system. Thus, to encourage citizen engagement and activism around health, stakeholders should focus on educating citizens on relevant rights, and building their perception of their role in participation (e.g. feeling they can speak up, that they are the bosses of the govt.). While it is challenging to integrate and prioritize demand side interventions within public health systems with severely limited resources, these findings suggest the importance of improving citizen knowledge and self-efficacy to increase health systems advocacy.

Future Research

While these findings suggest conceptual alignment between the activities undertaken in ABH, and the drivers of advocacy participation, further implementation research is needed to understand what activities most effectively foster knowledge of rights and responsibilities and perceptions of self-efficacy. For example, ABH has educated citizens on rights and responsibilities through multiple means, including: radio spots, television spots, a Patients' Charter, dramas, news stories, and songs. At this time, it has not been evaluated which of these activities are most effective in educating citizens on their rights and responsibilities.

Furthermore, implementation of the ABH program activities have not been evaluated or compared against other activities designed to increase knowledge of self-efficacy.

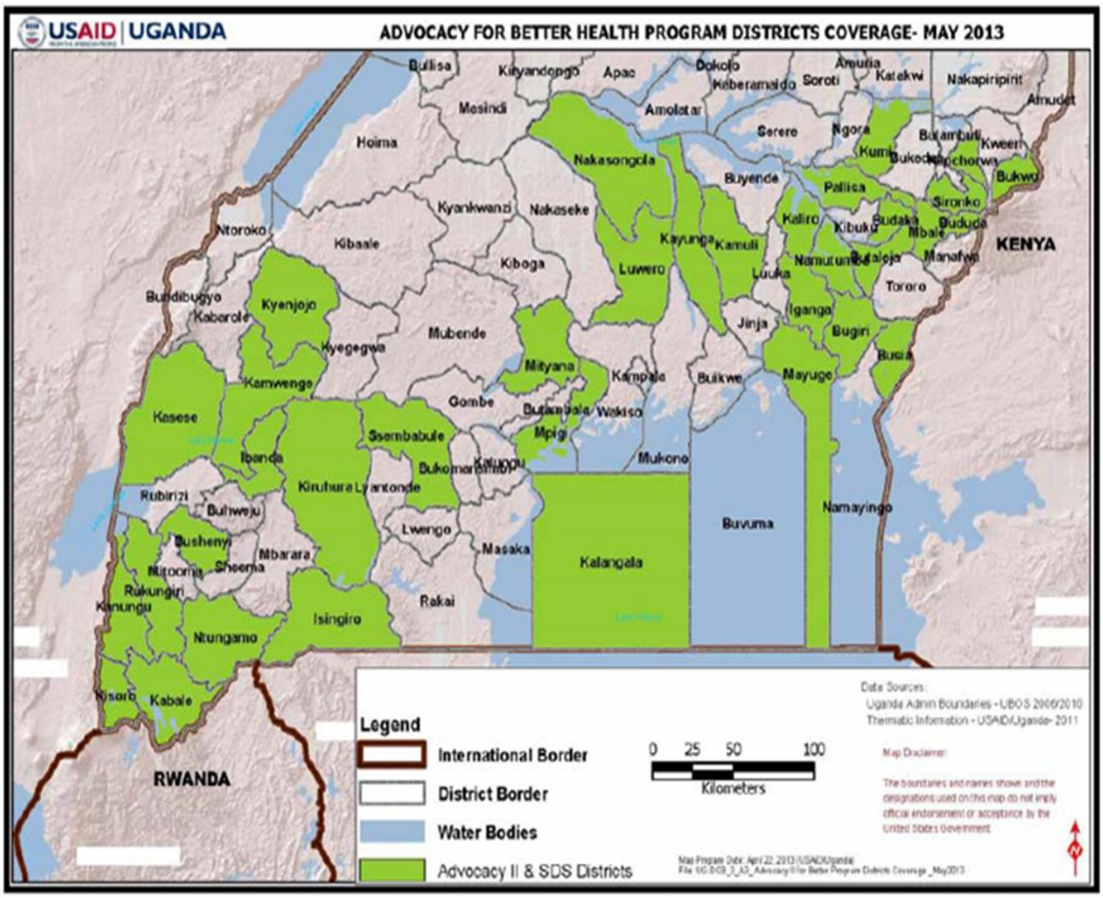
Future research should also examine the interplay of attitudes (individual beliefs) and norms (community beliefs) to better understand the relationship between individuals and communities for increasing knowledge and self-efficacy. As observed in our findings, two of the factors did not clearly load as either community norms or individual attitudes, instead encompassing elements of both, suggesting that the content of the belief is of primary importance, and is shaped by both community members and individuals. Understanding the relationship between communities and individuals in increasing knowledge and perceptions of self-efficacy is important to ultimately increase participation in advocacy.

Ethical Review

The midline evaluation was submitted to PATH's Research Determination Committee and was determined to be non-human subjects research; in-country IRB review was not undertaken in accordance with the research determination for the midterm evaluation. This thesis proposal was submitted for further ethical review to the University of Washington's IRB and was determined to be non-human subjects research.

Annexes

Annex 1. ABH Program Districts

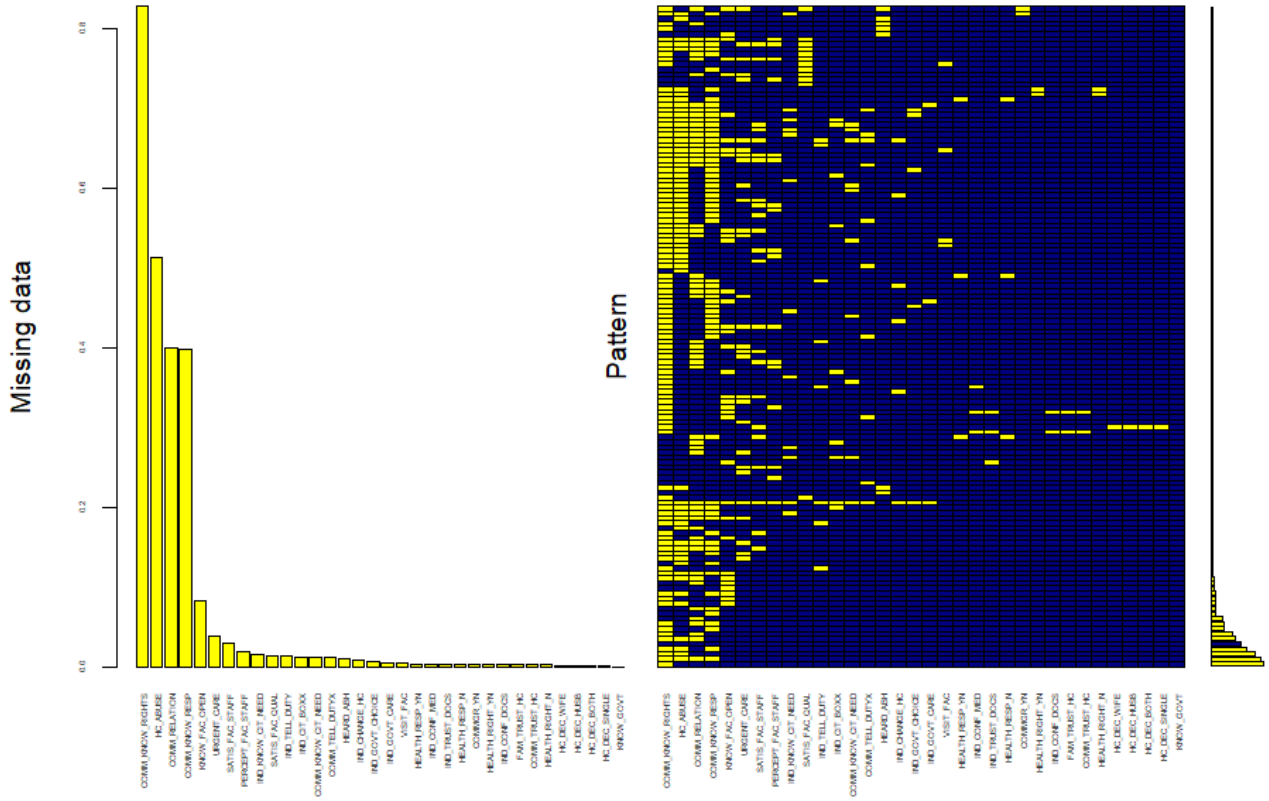


Annex 2. Data Cleaning

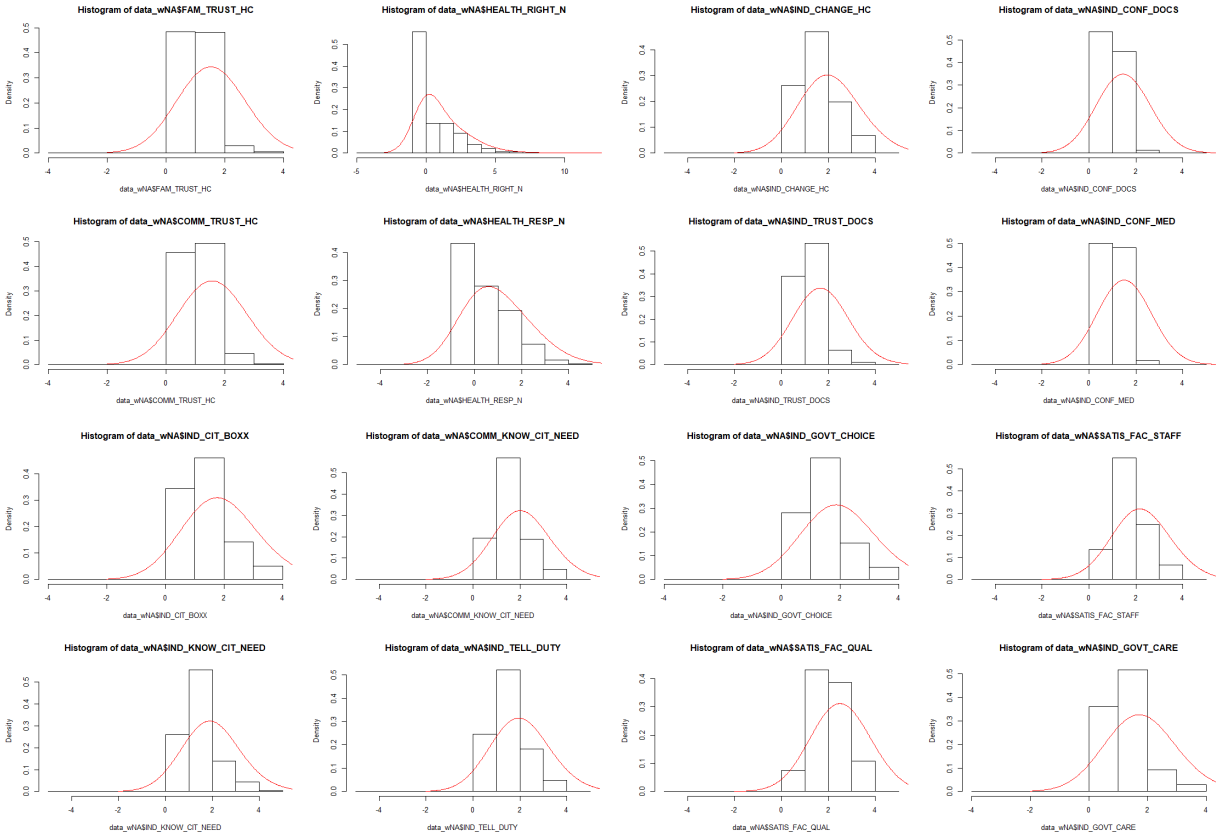
The full list of pre-specified variables is included in the factor analysis model. The associated survey questions are available upon request from the author. The original dataset is 1,296, however all observations from respondents under the age of 18 are excluded. While data for the original midline evaluation was reviewed by PATH's Research Determination Committee and determined to be non-human subjects research and subsequently collected, the ethical approval for this thesis did not include the use of data from respondents under age 18. This brings the sample down to 946. Age is calculated as the difference from the year of birth reported to 2017 (the time of survey). In the event that year of birth is unknown, age recall is used. Raw survey data is further recoded for ease of use in the analysis. All binary variables that are coded 2/1 are recoded to be 0/1, where 1 represents an affirmative answer. "Don't know" and "Decline to answer" are coded as missing values on the dataset. All ordinal and scale values are left as is on the dataset. This requires careful attention to the direction of the scale of each variable as the direction is not standardized. As noted on page 9, three variables are calculated based upon the answers to multiple questions: 1) number of health rights and responsibilities known; 2) education categories; and 3) wealth quintiles. The number of health rights / responsibilities known is computed using a count of the individual health information items mentioned. Where binary knowledge of health

rights is missing, it is imputed based upon the answer to the # of health rights known. Education is computed first based upon the categorical level provided; a category for “no education” is then calculated based upon the binary answer for “any education”. Categorical education takes precedence in the event of a conflict of data. Wealth quintiles are calculated using an asset-based index according to the Equity Tool methodology outlined on page 9. Four variables have greater than 15% missing on the data: 1) Experience of abuse; 2) opinion that community knows their health rights; 3) opinion that community knows their health responsibilities; 4) opinion of community relationship to health services. Annex 3 details the patterns of missingness further; page 10 details how missings are imputed for use in the analysis.

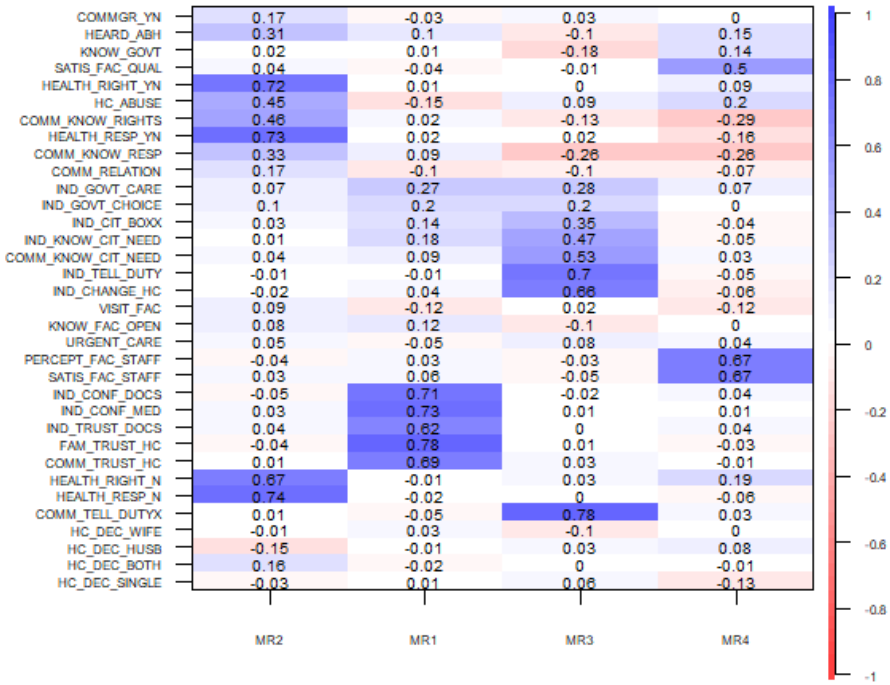
Annex 3: Missing patterns in the data



Annex 4: Continuous normal distribution of variables



Annex 5: Full factor loading



Variable	MR2 **Knowledge of rights and responsibilities**	MR1 **Trust in medical systems**	MR3 **Self-efficacy for health systems change**	MR4 **Perception of quality of health facility services**
Belonging to a community group	0.1713	-0.0258	0.0261	-0.0035
Having heard an ABH advocacy message	0.3101	0.1016	-0.0998	0.1535
Awareness of local government activities	0.0172	0.0096	-0.1805	0.1448
Satisfaction with quality of health services	0.0384	-0.0449	-0.0071	0.5001
Knowledge of health rights	0.7186	0.0057	-0.0015	0.0896
Experience of health rights abuse	0.4471	-0.1535	0.0905	0.1994
Opinion that community knows rights	0.4580	0.0206	-0.1290	-0.2859
Knowledge of health responsibilities	0.7290	0.0174	0.0151	-0.1551
Opinion that community knows responsibilities	0.3273	0.0935	-0.2552	-0.2579
Opinion of community relationship to health services	0.1745	-0.1006	-0.0951	-0.0733
Belief government cares for individual	0.0709	0.2723	0.2758	0.0663
Belief government. makes good choices	0.0954	0.1999	0.1997	-0.0025
Belief citizens are bosses of government.	0.0317	0.1402	0.3549	-0.0448
Attitude respondent knows health needs of community	0.0066	0.1834	0.4668	-0.0532
Opinion community knows health needs of community	0.0387	0.0898	0.5277	0.0276
Attitude respondent can tell duty bearers of needs	-0.0072	-0.0146	0.7014	-0.0539
Attitude respondent can make change in health services	-0.0174	0.0414	0.6600	-0.0590
Visited facility	0.0922	-0.1187	0.0162	-0.1153

Knows open hours of a facility	0.0846	0.1222	-0.0999	-0.0023
Urgency of need for medical care	0.0481	-0.0493	0.0817	0.0373
Perception of health facility staff work	-0.0409	0.0310	-0.0277	0.6654
Satisfaction with health facility staff	0.0290	0.0550	-0.0465	0.6723
Respondent confidence in doctors	-0.0470	0.7143	-0.0163	0.0412
Respondent confidence in medicine	0.0334	0.7287	0.0114	0.0140
Respondent trust in doctors	0.0440	0.6163	0.0043	0.0408
Family trust in health care	-0.0368	0.7823	0.0077	-0.0256
Community trust in health care	0.0116	0.6863	0.0296	-0.0084
Number of health rights known	0.6660	-0.0129	0.0268	0.1938
Number of health responsibilities known	0.7425	-0.0177	0.0034	-0.0588
Opinion that community can tell duty bearers of needs	0.0126	-0.0494	0.7815	0.0340
Healthcare decisions made by the wife	-0.0068	0.0263	-0.1049	0.0007
Healthcare decisions made by the husband	-0.1489	-0.0076	0.0338	0.0818
Healthcare decisions made by husband and wife	0.1565	-0.0202	-0.0025	-0.0109
Healthcare decisions made alone – single	-0.0340	0.0101	0.0567	-0.1283

References

Afrobarometer. (2011). *Quality of Democracy and Governance in Uganda.* [Measurement instrument]. Retrieved from http://www.afrobarometer.org/surveys-and-methods/questionnaires

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of applied social psychology*, *32*(4), 665-683.

Carifio, J., & Perla, R. (2008). Resolving the 50-year debate around using and misusing Likert scales. Medical Education, 42(12), 1150-1152.

Costello, Anna B. & Jason Osborne. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. Practical Assessment, 10(7), 1-9.

Equity Tool. (2016). *Equity Tool Measurement in Uganda.* [Measurement Instrument]. Retrieved from http://www.equitytool.org/uganda/

Fox-Cardamone, L., Hinkle, S., & Hogue, M. (2000). The Correlates of Antinuclear Activism: Attitudes, Subjective Norms, and Efficacy. Journal of Applied Social Psychology, 30(3), 484-498.

Glanz, K. (2015). Health Behavior : Theory, Research, and Practice (5th ed.). Wiley-Blackwell.

Gorsuch, R. (2015). *Factor analysis* (Classic ed., Routledge classic editions). London ; New York: Routledge.

Grice, J., & Appelbaum, Mark I. (2001). Computing and Evaluating Factor Scores. *Psychological Methods, 6*(4), 430-450.

Hall, E. T., & Hall, M. R. (2001). Key concepts: Underlying structures of culture. *International HRM: managing diversity in the workplace*, 24-40.

Hensher, D., & Stopher, Peter R. (1979). *Behavioural travel modelling*. London: Croom Helm. McFadden contributed Ch. 15 "Quantitative Methods for Analyzing Travel Behaviour on Individuals: Some Recent Developments".

Honaker, James, Gary King, & Matthew Blackwell. (2011). Amelia II: A Program for Missing Data. *Journal of Statistical Software*, *45*(7), 1-47.

Institute for Health Metrics and Evaluation [IHME]. 2015. Global Burden of Disease Country Profile: Uganda. Seattle, WA: University of Washington.

Kelly, C., & Breinlinger, S. (1995). Attitudes, Intentions, and Behavior: A Study of Women's Participation in Collective Action. *Journal of Applied Social Psychology, 25*(16), 1430-1445.

Kim, J., & Mueller, Charles W. (1978). Factor analysis : Statistical methods and practical issues (A Sage university paper). Beverly Hills, Calif.: Sage Publications.

Little, R., & Rubin, Donald B. (2014). Statistical Analysis with Missing Data (2nd ed., Wiley Series in Probability and Statistics). Hoboken: Wiley.

Manary, Matthew P, William Boulding, Richard Staelin, and Seth Glickman. (2015). The patient experience and health outcomes. *New England Journal of Medicine, 358,* 201-203.

Ministry of Health [MOH]. 2008. Uganda Service Provision Assessment Survey 2007. Kampala, Uganda: Ministry of Health and Macro International Inc.

Ministry of Health [MOH]. 2010. Health Sector Strategic Plan III, 2010/11 – 2014/15. Kampala, Uganda: Ministry of Health.

Ministry of Health [MOH]. April 2012. Uganda Health System Assessment 2011. Kampala, Uganda and Bethesda, MD: Health Systems 20/20 project, Abt Associates Inc.

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. Advances in Health Sciences Education, 15(5), 625-632.