Demographic and socio-cultural factors influencing the willingness and ability to invest in sanitation facilities by households in Busia County, Kenya

Vincent Mukhwana Ouma[1,&], David Omondi Okeyo[2], Rosebella Onyango[3]

[&]Corresponding author
Vincent Mukhwana Ouma, Amref Health Africa, Nairobi, Kenya

[1]Amref Health Africa, Nairobi, Kenya, [2]Kenya Nutritionists and Dieticians Institute, Nairobi Kenya, [3]Maseno University, Kisumu Kenya

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Corresponding author: Vincent Mukhwana Ouma, Amref Health Africa, Nairobi, Kenya (vincelon@gmail.com)

Abstract

Introduction: the UN General Assembly explicitly recognized the human right to sanitation and acknowledged it as essential to the realization of all human rights. The Kenyan constitution further recognizes that every Kenyan has a right to reasonable standards of sanitation. This however did not imply that the government would fully provide for sanitation for its people. Some of that responsibility lies with the community members, while the government lays more emphasis on sanitation provision at institutional level; the household level remains the responsibility of the household head. While trying to fulfil this obligation to provide sanitation at household level, there could be some demographic and socio-cultural factors influencing the willingness and ability to invest in sanitation facilities by households.

Methods: this was a cross-sectional study, employing quantitative methods with a sample size of 384. It was carried out in Butula and Teso South Sub-counties of Busia County, Kenya.

Results: socio-demographic and cultural factors such as household size (OR=0.95, CI=0.89-0.99, p<0.05), disease prevention (OR=1.96, CI=1.03-3.71, p<0.05), not sharing sanitation facility with chronically ill people (OR=20.4, CI=1.14-363, p<0.05); were significantly associated with willingness and ability to invest in sanitation.

Conclusion: every human, young or old, rich or poor, literate or illiterate, has a right to access basic sanitation with dignity, as such demographic factors were not critical in determining the willingness to invest. However social and cultural factors had a strong influence on the willingness and ability to invest in sanitation. These are useful to consider in designing interventions that target to increase sanitation coverage.

Introduction

Poor sanitation is responsible for 10% of the global disease burden [**1**]. Inadequate access to appropriate sanitation and hygiene practices largely impacts on the health of communities resulting to economic and financial loss and sanitation related illnesses such as diarrhoea, intestinal worms' infestation and upper respiratory tract infections [**2**]. In 2016, about 2.4 billion people globally lacked access to improved sanitation. Wide disparities also exist by region, with Sub-Saharan Africa and South Asia continuing to lag behind. Recent data show 69% and 64% of their population's still lack access, respectively. Although some 1.8 billion people globally have gained access to improved sanitation since 1990, the MDG target for sanitation was missed. Much of the deficit is in sub-Saharan Africa [**3**]. Access to sanitation and hygiene is a basic human right [**4**]. Through Resolution 64/292 [**5**], the UN General Assembly explicitly recognized the human right to sanitation and acknowledged it as essential to the realization of all human rights [**6**]. Inappropriate excreta disposal practices directly and indirectly expose humans to viral, bacterial, protozoal and parasitic infections in their leaps and bounds [**7**]. Enshrined in the Constitution of Kenya, chapter 4, Bill of Rights, is the right to "reasonable standards of sanitation" [**8**]. To achieve this, focus must shift towards investing in sanitation from national, county to the household level. The WHO/UNICEF Joint Monitoring Programme [**9**], puts the overall coverage at 31% (rural coverage 32% and urban at 27%). Over 6 million Kenyans still defecate in the open [**10**]. About half of the Kenyan population does not have access to proper sanitation facilities [**11**], implications are that about 80% of hospital admissions are sanitation related. A study conducted in 18 countries in Africa reveals that Kenya loses 27.4 billion shillings annually due to poor sanitation [**3**]. Busia County has been forefront in improving its sanitation profile [**12**]. The high levels of awareness however do not reflect in equal sanitation coverage. The willingness and ability to invest in sanitation could be affected by factors including demographics, social-cultural issues ascribed to by a household or community. These can be further examined in form of culture, which can impact negatively or positively on sanitation behaviour [**13**]; health education, learning experiences that help to increase knowledge; social marketing, approaches to influence behaviours that benefit individuals and communities for the greater social good [**14**]; individual preferences and choices; perceived health and environmental risks; cost; financial knowledge; laws and regulations [**8**] among others. According to World Bank, Busia County loses USD 5.18 million annually, yet it would require an investment of USD 0.25 million to bring the county to open defecation free status [**15**]. Limited studies have been done in Busia to determine the demographic and socio-cultural factors influencing the willingness and ability to invest in sanitation facilities. *'Willingness to invest in sanitation'* in this context is defined as quality or state of being prepared to do something; readiness. Also expressed as demand - an informed expression of desire for a particular service, measured by the contribution people are willing and able to make to receive this service, also referred to in this study as the willingness to pay for sanitation. On the other hand, *'ability to invest in sanitation'* is defined as the capacity of a community member to raise reasonable financial resource to pay for sanitation facilities, also expressed as supply, also referred to in this study as ability to pay for sanitation. *'Sanitation'* implies all interventions for the safe management and disposal of excreta, with the principal safety mechanism being the separation of excreta from all future human contact [**9**]. This is a follow up paper to similar work done in Busia County and published by the same authors under the title "Level of willingness and ability to invest in sanitation facilities by households in Busia County" [**16**]. The present paper specifically focuses on the demographic and socio-cultural factors that influence the willingness and ability to invest in sanitation facilities by households in Busia County.

Methods

This is a cross-sectional study carried out in Butula and Teso South sub counties of Busia County whose methodological details are quite similar to those described in the previous publication [**16**].

Sampling: the sample size, (n=384) was obtained using 95% confidence interval and a significance level of 5%, (Cochran's sample size formula for infinite populations i.e. over 50,000) estimated sanitation coverage for Busia County (Ministry of Health records, unpublished) resulting to a computed sample of

334 respondents. A 15% to the sample was added (total 384) to cater for non-response or any spoiled tools. The two sub counties, Butula and Teso South were purposively sampled for being occupied by different ethnic groups, the Luhyias and Iteso people. Sampling of enumeration areas was done independently within each stratum using the probability proportional to size method with households being the measure of size. Firstly was to determine the number of households to be interviewed in each of the two sub-counties by calculating the population proportions for each of the two sub-counties. Secondly, a number of sub-locations and subsequently villages from each Sub-county were randomly selected by use of listing and picking method. Using the Community Strategy Registers, a complete range of households codes was written on small pieces of papers, folded, mixed and a desired number (384 households) randomly picked from the bundle. The unit of study for the survey was the housing unit defined as the dwelling unit, occupied by one household. The enumerators were each allocated a number of sampled units within the same or nearby sub location for ease of data collection and logistics. The target interviewee was preferably the household head, since typically household heads are in-charge of expenditures and can make financial decisions. Data was collected through structure questionnaires and focus group discussions. The enumerators were taken through a one-day training session covering all aspects of the study prior to data collection. A total of 384 respondents were interviewed from the two sites and 8 focus group discussions conducted, 4 in either site.

Data management and analyses: filled questionnaire were checked for completeness and coded, entered into EPI Data, then transferred into SPSS V19 and analysed. Chi-square tests were used to determine proportions while Z-scores used to test conformity to normally expected levels. Logistic regression was used to identify factors influencing investment in sanitation, odds ratios applied to establish the strength of associations between critical variables and investment in sanitation; p-values < 0.05 were considered statistically significant.

Ethical consideration: scientific approval was sought from the Maseno University School of Graduate Studies. Ethical clearance was sought from Maseno University Ethical Review Committee. Permission was also sought from the County Director of Health of Busia County. During the study, informed consent was sought with full information being provided and comprehension being affirmed. Confidentiality was ensured through anonymity (using unique numbers); privacy during interviews and withdrawal at any point was allowed.

Results

A total of 384 respondents were interviewed for this study, 214(55.6%) male and 170(44.4 %) female. Out of the total, 181(47%) of the respondents had primary school education while 7(1.7%) had university education; 368(95.7%) were Christian while 4(1.0%) were pagan. The population had a mean age of 44.51 years (Standard Deviation=13.8), meaning majority of the population sampled was in the adult category with an average household size of 6 persons.

Levels of willingness and ability to invest in sanitation: majority of the respondents 329(85.7%) were willing to invest in sanitation while 321(83.6%) self-reported as able to invest in sanitation. Of those interviewed, 377(98.3%) had some knowledge on sanitation; 338(88.1%) owned a latrine while the remaining practiced open defecation. The most common latrine owned was the traditional pit latrine 226(67.7%) while few had the water closet 4(1.2%).

Reasons for investing in sanitation: disease prevention was the main motivator for latrine ownership 349(90.9%) with few indicating safety as their main motivator, 7(1.7%) **Figure 1**.

Demographic factors influencing willingness and ability to invest in sanitation: gender, age, household head, education, religion and household size were considered. Results revealed that only household size had a significant prediction of willingness to invest in sanitation. Based on odds ratio (OR), one unit increase in household size was likely to decrease the willingness by 0.95 times at crude level (OR=0.95, confidence interval, CI=0.89-0.99, p<0.05). All other factors demonstrated insignificant association with level of willingness both at crude and adjusted level and could easily be dropped. When

considered in relation to ability to invest in sanitation, gender (female) significantly contributed towards ability to invest. At crude level gender was likely to increase ability by 1.19 times (OR=1.19, CI=1.01-2.49, p<0.05). A similar association was demonstrated at adjusted level with higher ability of association where gender was more likely to increase the ability by 2.02 times (OR=2.02, CI=1.02-4.00, p<0.05). All other factors did not demonstrate any significant association both at crude and adjusted level **Table 1**.

Sanitation related factors influencing willingness and ability to invest in sanitation: the study examined factors around sanitation including; knowledge on sanitation, type of latrine owned, village latrine coverage, defecation sites, and consequences of not using latrines. Community health volunteers were the most influential source of sanitation information. As compared to public health officers and media, information by community health volunteers was significantly associated with increased willingness both at crude and adjusted level (OR=2.22, CI=1.24-4.01 and adjusted OR=2.06, CI=1.02-4.15, p<0.05). Ownership of latrine was likely to increase the willingness to invest in sanitation by 2.42 times at crude level (OR=2.42, CI=1.20-4.89, p<0.05) and by 17.8 times at adjusted level (OR=17.8, CI=3.69-85.9, p<0.05). Open defecation, or defecation in the bush was likely to reduce willingness to invest in sanitation by 0.36 times (OR=0.36, CI=0.19-0.67, p<0.05), meaning the people who practised open defecation were less willing to invest, however this did not have any significant association at adjusted level. The fear of spread of disease was likely to increase the ability to invest (OR=1.96, CI=1.03-3.71, p<0.05), open defecation was also likely to reduce ability by 0.5 times. The rest of the factors did not have any significant association with the level of ability to invest in sanitation **Table 2**.

Personal latrine preference characteristics influencing willingness and ability to invest in sanitation: various latrine characteristics were examined including cleanable floor/slab, covered squat-hole, wall and roof, lockable doors. Having a clean floor/slab (OR=0.34, CI=0.12-0.99, p<0.05), wall and roof (OR=0.34, CI=0.15-0.77, p<0.05), and lockable door (OR=0.37, CI=0.16-0.84, p<0.05), as part of latrine requirements was likely to reduce willingness, however, this did not have significant association at adjusted level. Having a cover squat hole on a latrine was significantly associated with increased ability at adjusted level (OR=2.39, CI=1.02-5.59, p<0.05) **Table 3**.

Socio-cultural practices influencing willingness and ability to invest in sanitation: various cultural differences such as not sharing a latrine with in-laws, children, visitors or chronically ill people were examined. On culture and traditions, 305(72.4%) reported that in-laws did not share latrines, 95(22.6%) indicated that children do not share with adults while 62(14.7%) were positive that people with chronic illnesses were not allowed to share latrine with the rest. A smaller percentage 43(10.2%) indicated that visitors do not share with the rest of the household members **Figure 2**. In laws not sharing (OR=2.12, CI=1.20-3.73, p<0.05) visitor not sharing (OR=7.77, CI=1.05-57.5, p<0.05), the chronically ill people not sharing (OR=11.9, CI=1.63-88.3, p<0.05) sanitation facilities was likely to increase the willingness. At adjusted level however, chronically ill people not sharing was likely to increase willingness by 20.4 times (OR=20.4, CI=1.14-363, p<0.05). When considered in relation to ability to invest in sanitation, the four cultural differences and practices significantly contributed towards ability to invest. At adjusted level, in laws not sharing (OR=2.43, CI=1.36-4.34, p<0.05) and chronically ill people not sharing (OR=9.86, CI=2.10-46.2, p<0.05) were significantly associated with increased ability to invest in sanitation **Table 4**.

External factors influencing willingness and ability to invest in sanitation: external factors were also examined including awareness on sanitation laws and presence of sanitation marketers. Awareness on sanitation laws was also likely to increase willingness by 3.28 times (OR=3.28, CI=1.51-7.12, p<0.05) and presence of sanitation marketers was likely to increase willingness by 2.21 times (OR=2.21, CI=1.26-3.90, p<0.05), when adjusted, presence of sanitation marketers had a significant association with willingness, it was likely to increase willingness by 4.89 times (OR=4.89, CI=2.19-10.9, p<0.05). In relation to ability to invest in sanitation, awareness on laws that encourage communities to construct sanitation facilities was likely to increase ability by 2.17 times (OR=2.17, CI=1.38-3.43, p<0.05). At adjusted level, awareness on sanitation laws was likely to increase ability by 2.17 (OR=2.17, CI=1.17-4.02, p<0.05) times.

Discussion

The study assessed the demographic and socio-cultural factors that influence the willingness and ability to invest in sanitation facilities by households in Busia County. The demographic factors considered included gender, age, household head, education, religion and household size; only household size had a significant prediction of willingness to invest in sanitation, that a one unit increase in household size was likely to decrease the willingness. This could be argued that, as household size increase, priorities shift to buying food, clothing, and education among others perceived to be pressing needs amidst limited resources while neglecting sanitation and increased exposure to effects of poor sanitation such as diarrheal diseases. In a similar study conducted in rural DRC Congo, an increase in household size was significantly associated with increase in poor sanitation related diarrheal incidence in children under five [**17**]. Gender; being female was the only factor slightly associated with increased ability to invest in sanitation, the rest of the factors were not critical. This agrees with a similar study conducted in rural Benin indicating that education and cultural factors are only minor drivers of sanitation demand [**18**]. Factors related to sanitation such as knowledge on sanitation, type of latrine owned, village latrine coverage, defecation sites, and consequences of not using latrines categorised as social in this study were examined. WHO defines health education as any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes [**9**]. Busia County is pro- health education through public barazas, media, at health facilities and even during home visits by health workers. Providing information about health benefits of a particular behaviour is sometimes sufficient to change behaviour [**19**]. Sharing of sanitation information by community health volunteers was associated with high levels of willingness and ability as compared to public health officers. The community health volunteers reside within those communities; hence likely to influence more, as compared to public health officers and media who are not constantly available in the villages [**20**].

Busia County has fully embraced the Community Strategy Concept with over 80% of the community covered by Community Units [**21**]. Under consequences of not using latrines, the fear of spread of disease was likely to increase the ability to invest, while open defecation was likely to reduce ability, this agrees with an earlier section that sought to establish the reason for investing in sanitation, disease prevention was demonstrably the strongest cue and motivation for sanitation investing. Disease prevention is one of the strongest motivators and cues to sanitation action. The Health Belief Model postulates that people who undertake a subjective assessment of a likely health condition may befall them for not taking or taking a particular action are likely to engage in health promoting behaviour. The fear of illnesses that may arise due to poor sanitation is likely to influence communities' willingness to invest in sanitation [**22**]. This however contradicts a similar study conducted in Vietnam indicating that fear at night, especially of animals, and personal harassment, were stated as the most critical motivators for latrine ownership [**1**]. The settings between rural Vietnam and Kenya could be different hence the difference in such cues. Individual preference has to do with sets of assumptions related to ordering some alternatives, based on the degree of happiness, satisfaction, gratification, enjoyment, or utility they provide, while intention on the other hand presents in form of a mental state of a commitment to carry out an action(s) in future [**22**]. Preferences for various latrine characteristics such as clean floor/slab, covered squat hole, wall and roof, lockable door on latrine were likely to reduce willingness and ability. Such additions, although they qualify for an improved sanitation facility, call for extra resources; people would rather take the basic minimum as indicated by results that majority of those who had latrines owned traditional pit latrines which do not offer a complete range of benefits derived from improved sanitation facilities. This directly depicts low prioritization of sanitation amongst rural communities.

Culture, man being a social animal, regulates his society not by blind instincts or detached reason, but rather by a set of ideas and skills transmitted socially from one generation to the next. In Busia County, mostly inhabited by bantu speaking natives, in-laws do not 'mix' their faeces, meaning that sharing a latrine becomes a challenge and hence result in or reversion to open defecation [**23**]. Findings reveal that practices such as in-laws do not share, children do not share with adults, visitors do not share, and

chronically ill people do not share sanitation facilities with rest of household occupants existed within the study community. Such practices had a strong association with both willingness and ability to invest in sanitation, in fact, sharing a sanitation facility with chronically ill persons was likely to increase willingness by 20.4 times and ability by 9.86 times. These findings concur with those from a similar study conducted in rural India indicating that culture and social forces shape health behaviours and interact with other determinants of health [**24**]. From an analytic point of view however one would wonder whether visitors and in-laws should visit more often, should there be more children, or more chronically ill people around so as to provide a positive impetus for communities to invest in sanitation? This scenario provides more of a negative reinforcement for a good sanitation practice. External factors such as sanitation laws and presence of sanitation marketers were likely to increase willingness and ability to invest in sanitation. The Public Health Act, Cap 242, Kenya laws provides for various types of sanitation facilities that should be provided depending on the premise; high end business parks to households. Such laws can be used to compel either government of the day or household to provide sanitation conveniences. This agrees with a similar study conducted in Rwanda, Uganda and Tanzania, where laws, regulations and policies were considered critical for creating an enabling environment for improving access to sanitation and hygiene services [**25**]. Such laws and policies however, should be coherent and supportive reflecting the needs and preferences of people.

Conclusion

The level of willingness to invest in sanitation was high among the study population, although this did not translate into similar levels of ability. Being female and household size were significantly associated with willingness and ability to invest in sanitation. Sanitation related factors such as knowledge on sanitation, fear of spread of disease were likely to increase willingness and ability, while open defecation, low village sanitation coverage and having extra additions of latrine such impervious slab, wall, door, roof etc. were likely to reduce willingness and ability. Cultural practices such as in-laws do not share, children do not share with adults, visitors do not share, and chronically ill people do not share sanitation facilities with rest of household occupants existed within the study community, and were likely to increase both willingness and ability. Additional external factors; sanitation laws and presence of sanitation marketers were significantly associated with increased willingness and ability to invest in sanitation. There is therefore need for government and other agencies in sanitation sector to promote other appropriate sanitation options in addition to the traditional pit latrine; promote interventions seeking to increase communities' sanitation coverage to make use of the high levels of willingness and studies on the role of and use of culture, customs and traditions in community sanitation promotion.

What is known about this topic

- Access to basic sanitation and hygiene services in rural Kenya is still a big challenge;
- People's culture, practices and way of life affect how they view and relate to sanitation and hygiene;
- Poor sanitation is directly and indirectly linked to ill-health outcomes.

What this study adds

- High levels of awareness on sanitation and hygiene and high levels of willingness to invest in sanitation do not necessarily result into high levels of investment in sanitation;
- Presence of in-laws and chronically ill people, could be used as positive cue for sanitation investment;
- Rural communities do not attach much weight to sanitation and hygiene as they do to food and education.

Competing interests

Authors declare no competing interests.

Authors' contributions

This paper is a product of 3 authors who contributed to the entire processes as shown below: Vincent M. Ouma contributed in drafting of the study proposal/protocols, data collection, management and analyses; and development of the manuscript. David O. Okeyo: reviewed study protocols, supported in designing of data collection tools, guiding on data analyses, software packages to be used, reviewing and giving technical input to the manuscript. Rosebella O. Onyango: reviewing of the study protocols, giving technical input on the main body of the study (introduction, background etc), supporting and guiding with ethical and scientific approvals, and reviewing and giving technical input to the manuscript.

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Tables and figures

Table 1: demographic factors influencing sanitation investment

Table 2: sanitation related factors influencing sanitation investment

Table 3: latrine preference characteristics influencing sanitation investment

Table 4: cultural practices affecting sanitation investment

Figure 1: reasons for investing in sanitation (n=384)

Figure 2: cultural practices affecting sanitation investment

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