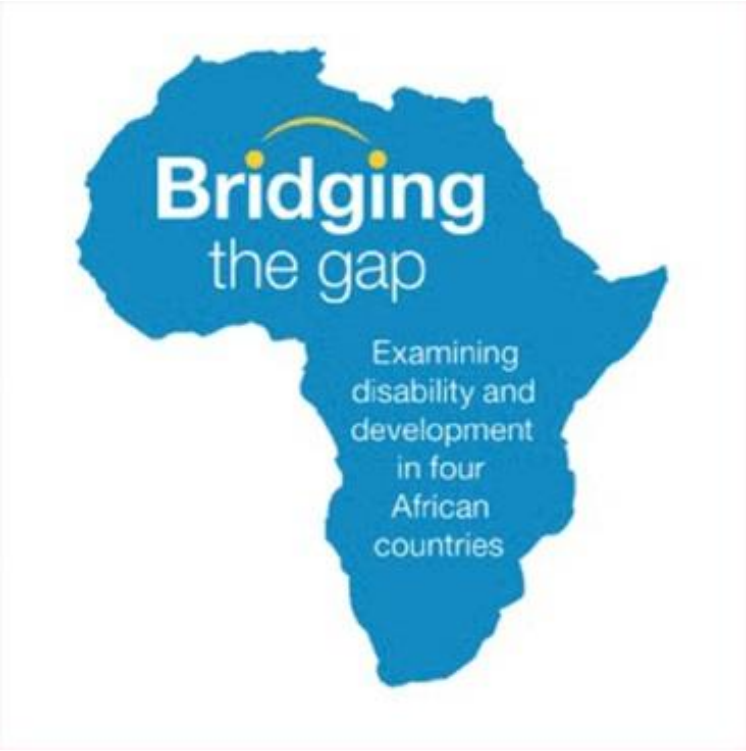
Bridging the Gap Secondary Data Analysis

An analytical report on the status and correlates of Disability in Kenya: Evidence from the 2009 Kenya Housing and Population Census



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Executive summary

Disability is one of the most neglected topics in development even though an estimated 80 percent of disabled people live in low and middle income countries (WHO, 2011). Kenya enacted the disability act in 2003 and carried out a national survey on persons with disability survey in 2007. The survey found that at least 4.6% of people in Kenya were living with disability. This was closely followed by including disability questions in the 2009 Kenya Housing and Population Census. The census found that at least 3.5% of Kenyans had disability. The purpose of this analytical report is to document the state of disability and its associated factors using the Kenya Housing and Population Census of 2009. The choice of this data source was informed by the fact that it is national in coverage, it is comprehensive in examining all the domains of disability and it is the most recent. While the results from the 10% allowable sample of the national census revealed that the national rate of disability was 3.5% provincial differentials point out that some provinces have very high rates of the disabled persons. Nyanza province has the highest disability rate of 22.9% and Rift valley (19.8%), Western (16.2%) and Eastern province (15.5%) have equally high prevalence rates of disability. On the other hand, North Eastern Province has the lowest rate of persons living with disability (4.7%). Physical, visual and hearing disabilities were the most common while self-care was the least mentioned among persons with one disability. This report found that disability was negatively associated with education. In particular, persons with disability were less likely to be currently in school and were also twice more likely to have never attended school as compared to their counterparts. In addition, using the household wealth as a proxy measure for wealth, results revealed that disability increased with the wealth status of the household. Persons with disability were also 1.2 times more likely to live in urban areas as compared to rural areas. Disability was also associated with lower odds of being employed. In particular, results revealed that as compared to persons with disability, those without disability were 1.3 times more likely to have engaged in work for pay in the last 7 days preceding the census. Future research should focus on the actual pathways on the disability –poverty nexus. Owing to the fact that Kenya has a devolved government, there is need to have a national survey that takes counties as the primary sampling units to characterize any environmental factors associated with disability. In order to prove causation, it would be important for planners and policy makers to think of setting up longitudinal studies to help in shedding further light on the probable multidimensional effect of disability on development.

Introduction

The World Health Organization (WHO 2011) perceives disability as a complex, dynamic, multidimensional and contested phenomenon. According to the international classification of functioning, disability and health (ICF) a person is considered disabled if the person has difficulties in one or any of the following areas: impairments, activity limitations and participation restrictions (WHO, 2001). An overriding phenomenon globally shows that people with disability face worsening health, social and economic wellbeing and poverty through a multitude of channels including the adverse impact on education, employment, earnings, and increased expenditures related to disability (Jenkins and Rigg, 2003; Shakespeare 2006). Despite this, Kenya is among the many African countries that have scanty studies that attempt to systematically document the disability situation with a view to inform better policies that could promote their inclusion. This study report attempts to address this gap.

As an overview, it is worth mentioning that Kenya's history in collecting secondary data on disability was only witnessed after the enactment of the Disability Act in 2003. A number of surveys done after the enactment of the disability act have included questions on disability. The Kenya National Survey on Persons with Disabilities (KNSPWD), 2007 was the first nationwide study to be carried out on people with disability. Two years later, the decennial Kenya Housing and Population Census of 2009 included questions on disability. However, unlike the preceding studies, other national surveys on population and health such as the Kenya Demographic and Health Surveys of 2008/09 and 2014 or the Multiple Indicator Surveys (MIS) did not include questions on disability. Equally, even where nationally representative studies have been done as is the case with the Kenya National Survey on People with Disability 2007 and the Kenya Housing and Population Census 2009, none adopted the recommended *Washington Group Questions* to measure disability.

While the issue of definition and measurement remains, the purpose of this report is to use the 10% nationally representative sample from the Kenya Housing and Population Census to document the state of disability in Kenya. The first section of the report sets the objectives and how they will be tested. This is followed by a discussion on the methodology and the key results.

Objectives

The overall objective of this report was to document the state of disability in Kenya and its effects of the affected persons. Specifically, the study sought to: -

1. document the extent of disability in Kenya and its associated characteristics

2. examine the extent to which disability disenfranchises the disabled in terms of access to education and economic participation

Hypotheses

We developed four hypotheses:

1. There is a negative association between disability and access to education.
2. Persons with disabilities are less likely to have access to health services as compared to those who are not disabled.
3. There is a relationship between household socio-economic status and disability.
4. The effect of disability differs by type of disability and the associated characteristics.

Methodology

This study report is based on an analysis of the 10% raw data from the Kenya Housing and Population Census of 2009 (KNBS, 2010). According to the Disability act 2003, persons with disability in Kenya are defined as those who have a physical, sensory, mental or other impairment, including visual, hearing or physical impairment which has substantial long term adverse effect on their ability to carry out usual day to day activities. The Kenya Housing and Population Census of 2009 ascertained the disability status of each individual by asking the head of the household or any other responsible member within the household whether any of the household members who spent the night in the household during the census had any of the following disabilities: -

a) Visual impairment
b) Hearing impairment
c) Speech and language difficulties
d) Physical disabilities
e) Mental disabilities
f) Self-care difficulties
g) Others (other disabilities).

In cases where a household member had more than one disability, the questionnaire allowed them to record the nature of disability up to a maximum of three ranking from the most severe to the least. An additional question on disability asked whether the disability made it difficult for the respondent to engage in any economic activity.

We however caution that disability is a complex measure and the use of a binary question on disability may lead to under-identification and measurement error. A critical limitation with the Census relates to the limited number of questions asked which tend to underestimate special population groups such as, children, elderly and persons with cognitive and psychological impairments. Furthermore, censuses have an

extensive use of proxy respondents and hence may not give a full picture of the extent of disability in a country. The data is therefore to be interpreted with caution.

The secondary analysis used a 10% sample from the Kenya Housing and Population Census of 2009. This is a huge sample of 3,842,606 million people. Permission requests to access the census raw data was sought and obtained from the Kenya National Bureau of Statistics. The 10% sample which is permissible to researchers for further analysis was converted from the original format in SPSS to Stata using the *StatTransfer version 13.0* programme. Data analysis was performed using Stata Version 14.0.

The unit of analysis was the individual person enumerated in the census. However, the Census collects data from the head of the household or any other responsible person within the household. Consequently, censuses have an extensive use of proxy respondents and hence may not give a full picture of the extent of disability in a country.

Information on the socio-economic well-being of the household was computed from a set of variables on household assets using a data reduction statistical technique called the Principle Component Analysis (PCA). The set of assets captured in the census include ownership of livestock (such as exotic cattle, indigenous cattle, sheep, goats, camels and donkeys), household conditions and amenities including numbers of dwelling units, habitable rooms and construction material, main source of water, main type of cooking fuel, main type of lighting fuel and main mode of human waste disposal. Additionally, the census collected information on ownership of household assets such as radio, television set, car, mobile phone, landline, bicycle, computer, animal drawn cart, boat, canoes, Tuk Tuk, lorry/tractor/bus and refrigerator.

Prior to running the PCA, all variables that were included in the construction of the household wealth index were categorized into binary variables as is conventionally expected. The only exception to this was for variables that were continuous such as the number of dwelling units, habitable rooms and number of livestock owned by type. Only the first principle component was used in the final computation of the household wealth index since it explained over 90% of the variance (not shown) between the selected variables for measuring household wealth.

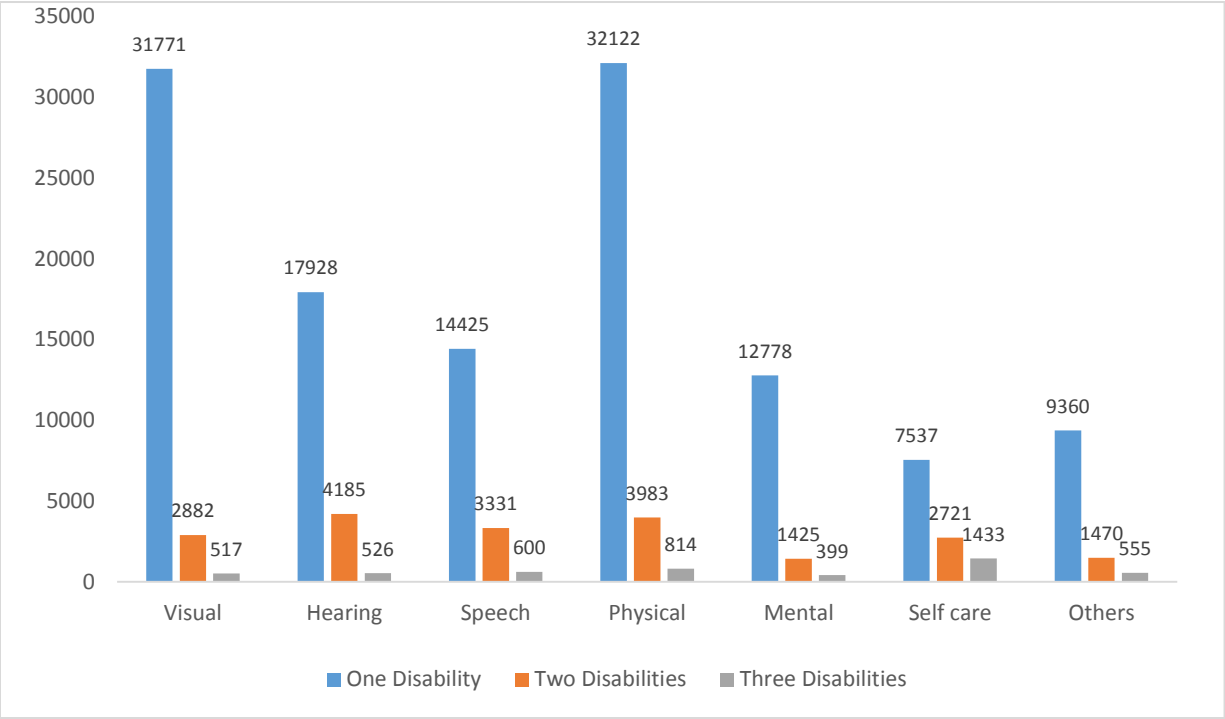
Data analysis entailed running frequencies to summarize the results of the background factors, as well as cross-tabulations with chi-square tests to test the association between disability status and the selected background characteristics. In order to account for the net effect of selected background characteristics on disability, the study reports results from a binary logistic regression analysis.

Key Results

Disability rate in Kenya

This section presents results on the association between disability and selected background characteristics of the respondents. Figure 1 shows the disability rates by type and frequency. Evidently, people with physical and visual disabilities formed the majority of people with at least one disability. These two forms of disability accounted for over a half of all the forms of disability reported (50.7%) among persons with at least one disability. Hearing, mental and speech disabilities were the other commonly mentioned forms of disability. Self-care was the least mentioned form of disability by respondents with only one form of disability.

Figure 1: Disability rates among persons with one or more disabilities, Kenya Housing and Population Census, 2009



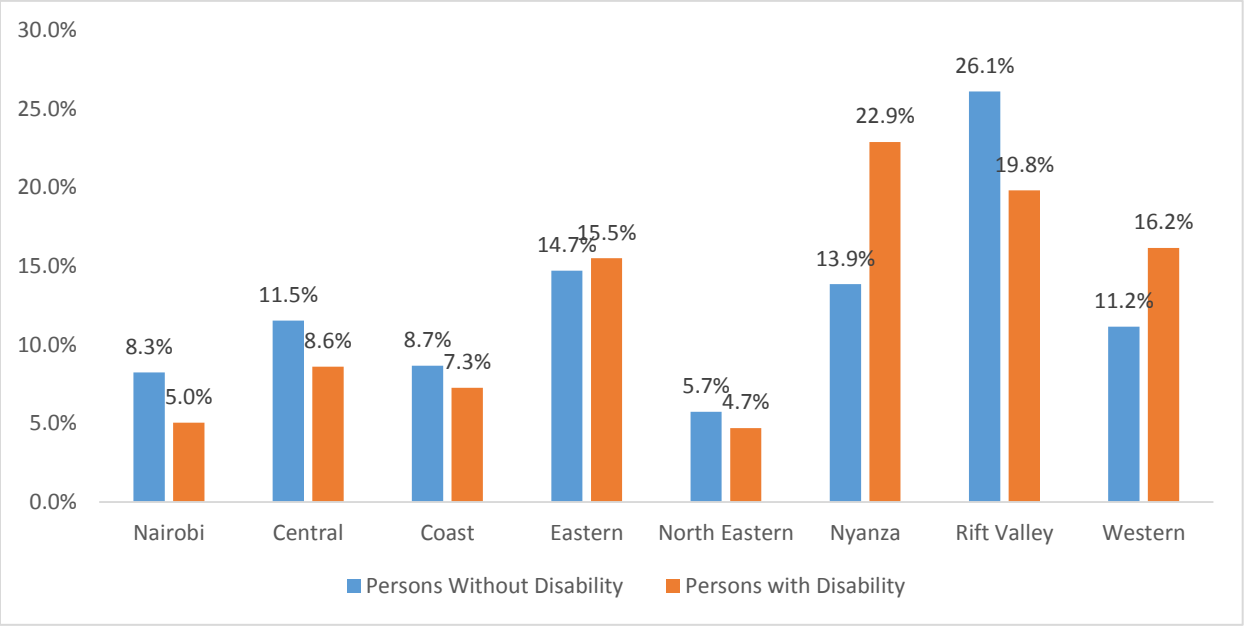
Among those with at least two forms of disability reported, physical, speech, hearing and physical disability were the most frequently mentioned type. Speech, visual and self-care were the other frequently mentioned forms of disability.

Among persons with at least three forms of disability reported, self-care was the frequently mentioned form of disability. This implies that persons who reported self-care as a form of disability were more likely to have at least two other forms of disability more often than the rest of the persons with other disabilities. In addition, persons with physical and speech disabilities were also more likely to have other two different disabilities though the numbers were far less than those who had self-care as a disability.

Overall Disability Rate

Overall, 3.47% of the 10% sample of Kenya's census as of August 24th, 2009 had at least one disability. However, regional differentials in disability existed. The census analysis shows that Nyanza province had the highest rate of disability (22.9%) followed by Rift valley (19.8%), Western (16.2%) and Eastern province (15.5%) while North Eastern Province had the least (4.7%). The differences in disability rates across the provinces was statistically significant *(p<.001)*.

Figure 2: Disability status by Province, Kenya Housing and Population Census, 2009



The census analysis further found that in general, there were marginal differences in disability among females and males (3.52% against 3.42% respectively). The disability rate computed from the census data (3.5%) is much lower than the 4.6% disability rate that was found in the Kenya National Survey on People with Disabilities (KNSPWD, 2007). Further, all national disability studies that had been carried in Kenya have found lower rates as compared to the WHO rates of about 6-15% disability rates globally (WHO 2011).

Disability by selected background characteristics

Table 1 shows a summary of the characteristics of the population by disability status. In specific, 49% of people with disability were males and the rest (51%) were females. There were almost an equal number of males to females among those who did not have disability (49.5% against 50.5%). Of the persons with disability, majority were Protestants and Catholics (45% and 25% respectively). Among those without disability, Protestants were the majority (48%) while those belonging to other religions (traditionalists and atheists, etc.) were the least (7.1%).

Table 1: Distribution of the Population by Disability Status, Kenya Housing and Population Census 2009

Characteristic	Yes –Has Disability		No-Has no disability	
	Cases	**%**	**Cases**	**%**
Sex				
Male	64,251	48.8%	1,815,926	49.6%
Female	67,410	51.2%	1,845,821	50.4%
Religion				
Catholics	29,554	25.1%	778,526	23.5%
Protestants	52,470	45.1%	1,580,958	47.9%
Other Christians	15,342	13.5%	388,964	11.9%
Muslims	11,009	9.3%	365,024	11.0%
Other	8,493	7.1%	189,281	5.7%
Household Wealth Index				
Poorest	24,225	20.2%	935,499	29.9%
Poor	29,026	24.2%	837,567	26.8%
Middle	35,470	29.6%	799,120	25.6%
Richest	31,093	26.0%	554,400	17.7%
Educational status				
Currently Attending school	30,872	24.6%	1,355,947	41.4%
Previously Attended school	54,484	43.4%	1,365,433	41.7%
Never Attended school	40,280	32.1%	556,391	17.0%
Age in years lived				
0-17 years	40,356	30.7%	1,845,660	50.4%
18-34 years	28,580	21.7%	1,052,771	28.8%
35-52 years	23,196	17.6%	512,808	14.0%
53-70 years	20,928	15.9%	190,186	5.2%
71-95 years	18,601	14.1%	60,322	1.7%
Marital Status				
Single	22,651	46.5%	927,425	63.8%
Married Monogamous	18,060	32.1%	556,384	29.1%
Married Polygamous	6,113	8.2%	85,179	3.6%
Divorced/separated/ widowed	12,766	13.3%	101,262	3.5%
Worked for pay in last 7 days				
No	477,126	13.03%	3,184,621	86.97%
Yes	13,506	10.26%	118,155	89.74%

Source: Primary analysis of census 2009

Among persons with disability, those in the middle class were the majority (30%) while the poorest households were the least (20%). Generally, disability was higher

among the middle class and the rich households and tended to decrease among the poorest households. It is likely that people with disability who are rich might more likely survive due to access to better healthcare as compared to their poor counterparts. In addition, richer people live longer and the longer one lives the greater the chance that one has a disability.

An analysis of the educational status versus disability (Table 1) encompassed the population who were at least aged 3 years. Results revealed that while 24.6% of people with disability were currently in a learning institution, the percentage for their counterparts was higher by 16.8 percentage points (41.4%). Further, while the percentage of people with disability who had previously attended school was not significantly different from that of people without disability, persons with disability were almost twice more likely to have never attended school as compared to those without disability (32.1% against 17.0% respectively).

Disability varies with age. Among the young (those below age 18 years), disability was the highest – an indication that part of the persons with disability in this age group could have been born with it. Generally, results show that disability tends to increase with age. For instance, below age 34 years, the percentage of the population without disability is much more as compared to that with disability. However, above age 34 years, the percentage of the population without disability drastically drops reaching about 2% by ages 71 years and above. As people age, the state of disability is likely to be further exacerbated by the growing rise in chronic health conditions that is associated with population ageing (WHO 2015).

In terms of marital status, having a disability was associated with lower chances of being married in a monogamous marriage but twice more likely to be married in a polygamous marriage as compared to having no disability (8.2% versus 3.6% respectively). Persons with disability were also more than three times more likely to be divorced, separated or widowed as compared to persons without any form of disability (13.3% versus 3.5% respectively).

Only 10.3% of the respondents with disability had worked for pay in the last one week preceding the census as compared to about 13% without disability and this difference was statistically significant ($x^2=867.118$; $p<.001$).

Disability status by Gender

The above analysis, though critical, negates the important aspect of disability prevalence rates by sex. For instance, are males who have disability more likely to have not had access to education than their female counterparts? Are females who

have disability more disadvantaged in getting married than their male counterparts? Is there a significant difference between sex and the household wealth index when measured against disability? To address these questions, we present results of disability disaggregated by sex to unmask further information that could not be captured in the preceding section.

Table 2 shows that males from economically disadvantaged households (poorest, poor or middle class) exhibited higher rates of disability as compared to their female counterparts. However, males from the richest households had lower disability as compared to females from similar households. In a patriarchal society like Kenya, it is likely that the males from rich households who have disability are more likely to be given attention as compared to their female counterparts and hence the observed higher disability rates among females as compared to their male counterparts. Most males and females with disabilities were from middle class households while most males and females without disabilities belonged to the poorest households. The lower disability rates from the poorest households is likely due to the fact that poverty exacerbates the severity of disability and increases deaths among the disabled as compared the disabled. The lower survival rates of the disabled among the poorest households is likely to account for the low disability rates in poor as compared to middle or wealthy households.

Table 2: Percentage Distribution of people with Disability disaggregated by sex, Kenya Housing and Population Census, 2009

Characteristic	Disability status -Males		Disability status -Females	
	Disability	**No Disability**	**Disability**	**No Disability**
Household Wealth Index				
Poorest	21.5%	30.7%	18.2%	28.7%
Poor	25.0%	26.9%	23.4%	27.1%
Middle	29.9%	25.2%	29.3%	25.9%
Richest	23.6%	17.2%	29.1%	18.3%
Educational status				
Currently Attending school	27.1%	43.1%	21.4%	39.6%
Previously Attended school	47.6%	41.7%	38.8%	41.8%
Never Attended school	25.3%	15.1%	39.8%	18.7%
Age in years lived				
0-17 years	33.8%	51.5%	27.6%	49.3%
18-34 years	23.0%	33.8%	20.5%	29.8%
35-52 years	17.3%	14.1%	17.9%	14.0%
53-70 years	14.2%	5.2%	17.5%	5.2%
71-95 years	11.6%	1.5%	16.5%	1.8%
Marital Status				

Single	50.9%	64.6%	38.0%	55.5%
Married Monogamous	36.3%	30.9%	30.3%	33.3%
Married Polygamous	6.1%	2.8%	10.3%	5.1%
Divorced/separated/ widowed	6.0%	1.7%	21.4%	6.1%

Source: Primary analysis of census 2009

Males who were disabled had a higher chance to be currently attending school as compared to their female counterparts (27.1% against 21.4% respectively). They equally had higher chances to have previously attended school as compared to their female counterparts (47.6% against 38.8% respectively). While a quarter of disabled males are likely not to have ever attended school, almost two fifths of females are likely never to have attended school (25.3% against 39.8% respectively) and this difference in school attendance is statistically significant ($p<.05$). Results show that males and females who are not disabled have much higher rates of being currently in school or to have previously been in school as compared to those who are disabled. The abled persons are also less likely to have never attended school as compared to the disabled, sex notwithstanding.

Males aged 0-17 years had the highest rates of disability (33.8%). In general, disability among females above age 35 years is much higher as compared to the rates observed among their male counterparts. Generally, people with disability were more likely to remain single than get married across both genders. Females who were disabled were more than three times more likely to be divorced, widowed or separated as compared to their male counterparts (21.4% against 6.0% respectively). Further, as compared to females who had no disability, those who were disabled were twice more likely to be married in a polygamous relationship (5.1% against 10.3% respectively). Equally, there was a higher likelihood of disabled men being in a polygamous relationship as compared to their male counterparts with no disability. However, the census data did not collect information on the timing of disability to enable an analysis of whether disability was a precursor to such marriages or was rather a consequence e.g. arising from the likelihood of elevated domestic violence in polygamous marriages.

Assessing the predictors of disability: A binary logistic regression analysis

This study examined the predictors of disability using a binary logistic regression model. Unlike the previous results which only presented the effect of each variable on disability status, regression analysis addresses the problem of confounders by allowing an assessment of the net effect of all the factors in one single model.

Table 3 shows that as compared to people from the poorest households, the rest had reduced chances of having people with disability (odds ratio<1) and this association was statistically significant ($p<.05$).

People with disability were almost 1.2 times more likely to reside in an urban setting as compared to residing in rural areas. As compared to Catholics, belonging to other religions is associated with reduced odds of experiencing disability except for the Muslims and those belonging to other religions (traditionalists and atheists). As compared to the Catholics, Muslims and those belonging to other religions such as traditionalists or atheists had 1.7 and 1.5 times increased odds of experiencing disability respectively. Religious inhibitions such as non-use of medical treatment in conventional health facilities is common among traditionalists; or non-use of medical services such as family planning; or inhibitions to get treated by a professional of opposite gender especially women as is common among Muslims in Kenya, could be compromising the health of the members of these religious affiliations with the end result of increased disability.

The net effect of marital status on disability is profound. As compared to those who are single, those who are married in a monogamous relationship had 1.5 times more likely to experience some form of disability. This could be a result of gender based domestic violence among the married monogamous cohorts which may result in disability. It could however be due to *survivor effect* i.e. the married survive longer due to existing social support systems from their partners as opposed to the singles who do not enjoy similar social support systems and hence are likely to die earlier.

Generally, as compared to those who were currently attending classes in an educational institution, those who had previously attended school or have never attended, were at reduced risk of experiencing disability. There is likelihood that people with disabilities have increased deaths and therefore there are fewer among the previous attendees or those who have never attended school at all. Finally, as compared with persons with disability, those without disability were 1.3 times more likely to have worked for pay in the last 7 days prior to the census undertaking of 2009.

Table 3: covariates associated with disability, Kenya Housing and Population Census, 2009

	Odds Ratio	Std error	Confidence Interval	
Household wealth Index				
Poorest [ref]				
Poorer	0.786	0.008	0.771	0.802
Middle	0.611	0.006	0.599	0.623
Richest	0.525	0.006	0.514	0.537
Type of residence				
Rural [ref]				
URBAN	1.185	0.011	1.163	1.207
PERI-URBAN	0.895	0.011	0.874	0.916

Religion				
Catholics [ref]				
Protestants	0.947	0.008	0.932	0.962
Other Christians	0.766	0.009	0.749	0.783
Muslims	1.664	0.022	1.622	1.706
Other	1.481	0.021	1.440	1.523
Marital status				
Single [Ref]				
Married Monogamous	1.455	0.018	1.421	1.490
Married Polygamous	0.889	0.015	0.861	0.919
Divorced/Widowed/Separated	0.327	0.005	0.317	0.337
Educational status				
Currently attending [Ref]				
Previously Attended	0.899	0.011	0.877	0.920
Never Attended	0.470	0.006	0.459	0.481
Age of the respondent				
0-17 years [Ref]				
18-34 years	.375	.007	.361	.390
35-52 years	.304	.006	.293	.316
53-70 years	.179	.004	.172	.187
71-95 years	.123	.003	.117	.128
Work for pay last 7 days				
Persons with Disability (ref)				
Persons without Disability	1.29	0.000	1.266	1.320
_cons	72.649	1.416	69.927	75.478

Source: Primary analysis of census 2009

Type of disability and associated characteristics: a multinomial regression analysis

While the preceding analysis brings out important findings in so far as disability and development is concerned, the reality is that not all the different domains of disability face a similar disadvantage to access to development. The fact is that disability is a heterogeneous group and therefore a binary analysis that considers the disabled as a homogenous group against those without disability as is the case in the preceding analysis negates the differences among the disabled group in access to various dimensions of social inclusion. In order to address this gap, this section employs a multinomial logistic regression model to assess how the various domains of disability were affected by the various covariates of development using persons with physical disabilities as the base outcome.

Results from Table 9 shows that as compared to persons with physical disabilities, those with visual impairment were not statistically different ($p>0.05$) in terms of their religious affiliations. Persons with visual impairment were 49% more likely to be married in a monogamous family as compared with those with physical impairment. Likewise, they had increased odds of being married in a polygamous relationship as well as being divorced separated or widowed as compared to those with physical impairment (1.6 and 1.4 times more likely as compared to those with physical impairment).

Disability increases with age. As compared to persons with physical disability, those with visual impairment increasingly experienced higher odds with age. Persons with visual impairment were 1.4 times more likely to live in urban areas as compared to those with physical disabilities and this association was statistically significant ($p<.001$). Persons with visual impairment were also 1.9 times more likely to belong to the richest households as compared to those with physical impairment. However, persons with visual impairment were less likely to have previously attended school as compared to those with physical disabilities. They were also less likely to have never attended school as compared to those with physical disabilities and this association was statistically significant. Finally, persons with visual impairment were 1.1 more times likely to be females as compared to persons with physical disabilities ($p<.001$).

Table 4: Multinomial log odds of the covariates associated with visual impairment, Kenya Housing and Population Census, 2009

Physical Impairment (base outcome)					
Visual Impairment	**Coef.**	**Odds Ratio**	**P>z**	**[95% Conf. Interval]**	
Marital status					
Never married (ref)					
Married Monogamous	0.4016	1.494	<.001	0.3442	0.4591
Married Polygamous	0.4708	1.601	<.001	0.3961	0.5455
Divorced/separated/widowed	0.3465	1.414	<.001	0.2754	0.4176
Age					
0-17 years (ref)					
18-34 years	0.0773	1.080	<.001	0.0100	0.1446
36-52 years	0.1352	1.145	<.001	0.0557	0.2148
53-70 years	0.3128	1.367	<.001	0.2311	0.3945
71-95 years	0.6295	1.877	<.001	0.5438	0.7151
Type of residence					
Rural (ref)					
Urban	0.3554	1.427	<.001	0.3000	0.4108

Peri-urban	0.0448	1.046	0.124	-0.0123	0.1018
Household wealth Index					
Poorest (Ref)					
Middle	0.0987	1.104	<.001	0.0572	0.1402
Richer	0.1278	1.136	<.001	0.0817	0.1740
Richest	0.6391	1.895	<.001	0.5682	0.7100
School attendance					
Currently attending (Ref)					
Previously attending	-0.6990	0.497	<.001	-0.7648	-0.6332
Never attended school	-0.7463	0.474	<.001	-0.8135	-0.6791
Sex					
Male (Ref)					
Female	0.1330	1.142	<.001	0.0991	0.1669
_cons	0.1969	1.218	<.001	0.0919	0.3018

Source: Primary analysis of census 2009

Persons with hearing impairment were more likely to be married or divorced, separated and widowed as compared to those with physical impairment. In addition, they were less likely to stay in urban or peri-urban area as compared to those with physical disability.

Table 5: Multinomial log odds of the covariates associated with hearing impairment, Kenya Housing and Population Census, 2009

Physical Impairment (base outcome)					
Hearing impairment	**Coef.**	**Odds Ratio**	**P>z**	**[95% Conf. Interval]**	
Marital status					
Never married (ref)					
Married Monogamous	0.1989	1.220	<.001	0.1303	0.2675
Married Polygamous	0.1650	1.179	<.001	0.0723	0.2576
Divorced/separated/widowed	0.2014	1.223	<.001	0.1149	0.2879
Age					
0-17 years (ref)					
18-34 years	-0.2136	0.808	<.001	-0.2852	-0.1421
36-52 years	-0.6245	0.536	<.001	-0.7149	-0.5341
53-70 years	-0.6542	0.520	<.001	-0.7478	-0.5605
71-95 years	-0.3229	0.724	<.001	-0.4202	-0.2257
Type of residence					
Rural (ref)					
Urban	-0.0839	0.920	0.021	-0.1553	-0.0124

Peri-urban	-0.1418	0.868	<.001	-0.2123	-0.0713
Household wealth Index					
Poorest					
Middle	-0.2609	0.770	<.001	-0.3109	-0.2108
Richer	-0.2655	0.767	<.001	-0.3213	-0.2097
Richest	-0.4050	0.667	<.001	-0.5073	-0.3028
School attendance					
Currently attending (Ref)					
Previously attending	-0.7370	0.479	<.001	-0.8082	-0.6658
Never attended school	-0.5314	0.588	<.001	-0.6002	-0.4626
Sex					
Male (Ref)					
Female	0.1354	1.145	<.001	0.0956	0.1752
_cons	0.2698	1.310	<.001	0.1317	0.4078

Source: Primary analysis of census 2009

They were equally less likely to come from middle or wealthy households as compared to those with physical disability. Worse still, they were less likely to have previously attended school as compared to those with having speech impairment. There was also a reduced likelihood of getting married as compared to having a physical impairment. Unlike physical impairment, speech impairment was negatively associated with age- it tended to reduce with age. Lastly, they were more likely to be females as compared to those with physical impairment.

Table 6: Multinomial log odds of the covariates associated with speech impairment, Kenya Housing and Population Census, 2009

Physical Impairment (base outcome)					
Speech impairment	**Coef.**	**Odds Ratio**	**P>z**	**[95% Conf. Interval]**	
Marital status					
Never married (ref)					
Married Monogamous	0.0466	1.048	0.183	-0.0219	0.1152
Married Polygamous	-0.1970	0.821	0.001	-0.3130	-0.0810
Divorced/separated/widowed	-0.4217	0.656	<.001	-0.5340	-0.3093
Age					
0-17 years (ref)					

18-34 years	-0.2346	0.791	<.001	-0.3051	-0.1640
36-52 years	-0.9877	0.372	<.001	-1.0800	-0.8954
53-70 years	-1.7301	0.177	<.001	-1.8391	-1.6212
71-95 years	-2.3362	0.097	<.001	-2.4823	-2.1901
Type of residence					
Rural (ref)					
Urban	0.2325	1.262	<.001	0.1630	0.3019
Peri-urban	-0.0290	0.971	0.469	-0.1075	0.0495
Household wealth Index					
Poorest					
Middle	-0.0633	0.939	0.028	-0.1197	-0.0069
Richer	0.1674	1.182	<.001	0.1103	0.2245
Richest	0.1752	1.191	<.001	0.0823	0.2681
School attendance					
Currently attending (Ref)					
Previously attending	-0.3398	0.712	<.001	-0.4126	-0.2670
Never attended school	-0.0727	0.930	0.039	-0.1419	-0.0036
Sex					
Male (Ref)					
Female	0.0107	1.011	0.625	-0.0322	0.0536
_cons	0.4330	1.542	<.001	0.3091	0.5570

Source: Primary analysis of census 2009

In addition, having a speech impairment was associated with a 1.3 times more likely to live in an urban area as compared to having a physical disability. Persons with speech impairment were 1.2 times more likely to come from wealthier households as compared with those with physical disability.

In comparison with persons with physical disability, those with speech impairment were less likely to have previously attended school (*AOR=0.712; p<.001*) and almost

just as likely never to have attended school as compared to those with physical impairment (*AOR=0.930; p<.001*).

Results show that persons with a mental impairment were likely to have been married or even divorced, separated or widowed (*AOR<1; p<.001*). Speech impairment tended to decrease with age. As compared to persons with physical disability, those which mental impairment were 1.7 times more likely to experience disability at ages 18 -34 years but at higher ages (above age 52 years) the log odds of experiencing mental disability reduced drastically as compared to those of experiencing physical disability.

Table 7: Multinomial log odds of the covariates associated with mental impairment, Kenya Housing and Population Census, 2009

Physical Impairment (base outcome)					
	Coef.	**Odds Ratio**	**P>z**	**[95% Conf. Interval]**	
Mental impairment					
Marital status					
Never married (ref)					
Married Monogamous	-1.4100	0.244	<.001	-1.4800	-1.3400
Married Polygamous	-1.4304	0.239	<.001	-1.5487	-1.3122
Divorced/separated/widowed	-0.8600	0.423	<.001	-0.9507	-0.7692
Age					
0-17 years (ref)					
18-34 years	0.5079	1.662	<.001	0.4364	0.5795
36-52 years	0.3923	1.480	<.001	0.3035	0.4811
53-70 years	-0.2907	0.748	<.001	-0.3939	-0.1876
71-95 years	-0.9098	0.403	<.001	-1.0372	-0.7824
Type of residence					
Rural (ref)					
Urban	-0.1420	0.868	0.001	-0.2222	-0.0619
Peri-urban	0.0100	1.010	0.803	-0.0684	0.0884
Household wealth Index					
Poorest					
Middle	-0.5994	0.549	<.001	-0.6604	-

					0.5384
Richer	-0.3198	0.726	<.001	-0.3815	-0.2582
Richest	-0.8194	0.441	<.001	-0.9426	-0.6963
School attendance					
Currently attending (Ref)					
Previously attending	0.4060	1.501	<.001	0.3291	0.4830
Never attended school	0.5204	1.683	<.001	0.4463	0.5945
Sex					
Male (Ref)					
Female	-0.0605	0.941	0.009	-0.1061	-0.0150

Source: Primary analysis of census 2009

Persons with mental disability were less likely to live in urban areas as compared to those with physical disability. They are also less likely to belong to household that were wealthy (AOR<1; *p<.001*) as compared to those with physical impairment. In addition, they were 1.6 times never likely to have attended school as compared to those with physical disability but 1.5 times more likely to have been previously in school. Persons with mental disabilities were less likely to be females as compared to those with physical disabilities.

Persons with self-care disabilities were less likely to be married as compared to those with physical disabilities. However, they were 1.2 times more likely to be divorced, separated and widowed (*p=.004*).

Table 8: Multinomial log odds of the covariates associated with self-care impairment, Kenya Housing and Population Census, 2009

Physical Impairment (base outcome)					
	Coef.	**Odds Ratio**	**P>z**	**[95% Conf. Interval]**	
Self-Care					
Marital status					
Never married (ref)					
Married Monogamous	-0.1377	0.871	0.009	-0.2417	-0.0338
Married Polygamous	-0.0653	0.937	0.312	-0.1919	0.0613
Divorced/separated/widowed	0.1682	1.183	0.004	0.0534	0.2830
Age					

0-17 years (ref)					
18-34 years	0.1404	1.151	0.038	0.0077	0.2732
36-52 years	-0.0836	0.920	0.302	-0.2424	0.0751
53-70 years	0.5954	1.814	<.001	0.4434	0.7473
71-95 years	1.9293	6.885	<.001	1.7815	2.0771
Type of residence					
Rural (ref)					
Urban	0.1888	1.208	<.001	0.0870	0.2905
Peri-urban	0.0323	1.033	0.514	-0.0648	0.1294
Household wealth Index					
Poorest					
Middle	-0.3313	0.718	<.001	-0.4075	-0.2551
Richer	-0.1610	0.851	<.001	-0.2447	-0.0773
Richest	-0.1904	0.827	0.016	-0.3449	-0.0359
School attendance					
Currently attending (Ref)					
Previously attending	-0.2261	0.798	0.001	-0.3595	-0.0927
Never attended school	0.2522	1.287	<.001	0.1218	0.3825
Sex					
Male (Ref)					
Female	0.2036	1.226	<.001	0.1438	0.2634
_cons	-1.8921	0.151	<.001	-2.1004	-1.6838

Source: Primary analysis of census 2009

Persons with self-care disabilities were more likely to reside in urban areas as compared to those with physical disabilities. In addition, they were less likely to come from middle level or wealthy households as compared to persons with physical disabilities. Persons with self-care disabilities were less likely to have previously attended school as compared to those with physical disability. Further, they were more likely to have never attended school as compared to those with physical disabilities (*AOR=1.3; p<.001*). Finally, census results revealed that persons with self-care disabilities were 1.3 times more likely to be females as compared to those with physical disabilities.

Other disabilities

Other disabilities included Albinism, Down syndrome, Fragile X syndrome and Fetal Alcohol Spectrum Disorder (FASD) among others. Results revealed that persons with other forms of disability were generally more likely to be married in a monogamous or polygamous marriage. In addition, they were more likely to have been divorced, separated or widowed as compared to persons with physical disabilities and this association was statistically significant (p=*.001*).

Table 9: Multinomial log odds of the covariates associated with other disabilities, Kenya Housing and Population Census, 2009

Physical Impairment (base outcome)					
	Coef.	Odds Ratio	P>z	[95% Conf. Interval]	
Other Disabilities					
Marital status					
Never married (ref)					
Married Monogamous	0.1032	1.109	0.012	0.0224	0.1841
Married Polygamous	0.1321	1.141	0.023	0.0183	0.2460
Divorced/separated/widowed	0.1800	1.197	0.001	0.0757	0.2844
Age					
0-17 years (ref)					
18-34 years	-0.1337	0.875	0.004	-0.2244	-0.0431
36-52 years	-0.4585	0.632	<.001	-0.5689	-0.3481
53-70 years	-0.5426	0.581	<.001	-0.6583	-0.4269
71-95 years	-0.8042	0.447	<.001	-0.9353	-0.6730
Type of residence					
Rural (ref)					
Urban	0.0151	1.015	0.723	-0.0684	0.0985
Peri-urban	0.0780	1.081	0.065	-0.0049	0.1609
Household wealth Index					
Poorest					
Middle	0.1210	1.129	<.001	0.0610	0.1811
Richer	0.0714	1.074	0.035	0.0051	0.1377
Richest	-0.1087	0.897	0.071	-0.2266	0.0092
School attendance					
Currently attending (Ref)					
Previously attending	-0.2757	0.759	<.001	-0.3656	-0.1858
Never attended school	-0.5179	0.596	<.001	-0.6091	-0.4268
Sex					
Male (ref)					
Female	0.3236	1.382	<.001	0.2739	0.3733
_cons	-0.8022	0.448	<.001	-0.9599	-0.6446

Source: Primary analysis of census 2009

Persons with other disabilities were not significantly different from those with physical disabilities in terms of their place of residence (p-value>0.05). They were however more likely to come from middle or richer households as compared to

persons with physical disabilities. Persons with other disabilities were also less likely to have previously attended school or to have never attended school as compared to persons with physical disabilities and this association was statistically significant (*AOR<1; p<.001*). Finally, persons with other disabilities were 1.4 times more likely to be males as compared to those with physical disabilities.

Discussion of the results

The purpose of this study was to characterize disability in Kenya and describe its association with a set of development related indicators such as education, type of residence and household wealth index. In order to accomplish this, descriptive and inferential analysis of the factors associated with disability was performed. Results from the 2009 Housing and Population Census revealed that overall disability rate in Kenya was 3.5%. This rate is likely to be understated owing to the fact that the definition and measurement adopted during the census is not based on the Washing Group set of questions. According to the WHO (2010) definition (which is based on the International Classification of Functioning (ICF)), disability rates at country level ranges between 5-15%. Disability tended to increase with age. Further, persons with disability were disadvantaged in terms of educational attainment, marriage and poverty status. This could be a pointer that having wealth enables households to deal more effectively with disability as compared to being poor. The counterfactual can also apply i.e. having wealth might reduce disability caused from poor living conditions, and also that people with disabilities are more likely to experience more barriers in creating wealth.

There are several pathways between disability and poverty: the onset of disability may lead to lower living standards and poverty through adverse impact on education, employment, earnings, and increased expenditures related to disability (Mistra, et al., 2011). Conversely, poverty may increase the risk of disability through several pathways, many of which are related to poor health and its determinants.

The poverty level faced by persons with disability is far higher than that faced by those without disability. Due to a multitude of factors, poverty leads to disability and disability is a harbinger of more disability, resulting in a vicious circle of poverty and disability (Kenya National Commission on Human Rights 2007). In Africa 80 million people are disabled and face extreme poverty (Kamga 2013). Globally various studies confirm that disabled people are more likely to be poor due to a range of institutional, attitudinal and environmental factors resulting in social exclusion and violation of human rights (Lang 2009, Groce et al 2011). Therefore, results from the univariate and multivariate analysis in this study could be pointing to the fact that due to the adverse impact of poverty among people with disability, most die earlier

making it appear as if it is indeed the rich that bear the brunt of disability when the reality is in the reverse direction.

Results clearly show that people with disability more often resided in urban residence areas. The results are consistent with qualitative work which equally revealed that majority of people with disability resided in urban areas. In Kenya, a study by Cobley 2012 revealed that only 16% of disabled persons interviewed had worked for pay and of these 9% were in the rural areas while 25% were in the urban setting. The study further argued that this could be attributed to poor infrastructure and difficult terrain that did not allow people with disability to access education and subsequently employment. Barriers on access to employment or any livelihood are linked to existing means of production which in rural settings is largely attributed to farming and small enterprises (AU for the Blind 2007). For example, in a qualitative study on poverty and disability conducted in Kenya, PWDs and in particular women found it easier to migrate to towns as it has more opportunities for employment. A case in point is a woman in Narok town whose home district (County was Kisii) but felt more comfortable in Narok town as she was able to engage in a variety of income generating activities (Ingstad and Grut, 2007).

The results from the computed household wealth index in relation to disability are interesting. In their study on disability and poverty in Kenya, Ingstad and Grut (2007) employed a qualitative approach to investigate the life experiences of persons with disability in Kenya; focusing on Nairobi, Kisumu, Kisii, Narok, Kwale and Kilifi districts (now counties). They focused on the whole range of disabilities. Their findings suggested that the nature of the household/family support and gender play a major role in the experiences of person with disability. More importantly poorer households experienced great difficulty in supporting a child with disability, sometimes having to stop working altogether, to the detriment of the rest of the household. In Mombasa one father had to give up work to take care of his son who wanted to go to school but his social behavior combined with lack of fees kept him out of school.

> *----the father stayed at home while the mother worked in the fields. The boy suffered from epilepsy and his social behavior sometimes caused conflicts with neighbors. ----the father was exhausted and worried about the boy's future and the family's future (Ingstad and Grut 2007)*

Besides this, the rather positive association between disability and wealthier households could be pointing to the fact that the wealthy households may be more open and do not face stigma in reporting disabled persons. Equally, while the rich/ wealthy households are able to deal and resolve some forms of age related disability such as poor vision and hearing including non-communicable diseases, the poor

households may not see these as disability per se but rather may view them as consequences of advancing age.

The disability–education disadvantage was discernible in our study. In a previous study, out of an estimated 1.5 million disabled children only 1.7% had access to formal education (Nilsson and Nilsson 2011) and the curriculum was too rigid to accommodate disabled children especially the deaf where the trained teachers were limited. These findings resonate with the monitoring report by the Kenya national commission on human rights based on findings from 12 counties where it is evident that although a special needs education policy on 2009 is in place there is very little in terms of implementation. It goes on to state that educational outcomes for children with disability are still low, illiteracy among adults and children of school going age with disability is still higher than those without disability in the general population. Similarly, the dropout rates for school going children with disability are higher than their counterparts without disability. The poor attendance is attributed to poor infrastructure, lack of resources to facilitate transition and completion and an overall setting of poverty and stigmatization (KNCHR 2014). The expenses connected with having a disabled child in school easily exceed the expenses for a non-disabled one. Faced with such expenses, many poor parents still have to prioritize among their children and often end up sending the able bodied to school before the disabled ones (Ingstad and Grut 2007)

A Global Initiative on out- of -school children (UNICEF 2014) report indicates that an estimated 90 per cent of children with disabilities in the developing world do not go to school. In India, 38 per cent of children ages 6 to 13 with disabilities were found to be out of school. In as much as many governments may be pursuing an inclusive education policy, many schools have not received the necessary support to implement the policy. The limited access to schooling for disabled children has been linked to a lack of understanding about different forms of disability and specific needs, as well as a lack of teacher training and physical facilities, and discriminatory attitudes towards disability and difference (GEM 2015). A survey carried out in northern Uganda (Global Movement for Children Report, 2010) found more than 50% of the children with disabilities were not going to school. The lack of user-friendly facilities, such as ramps for the children in wheelchairs, user-friendly classroom furniture, toilets and brail materials for the blind, and hearing aids for the deaf, among others were mentioned as hindrances. Lack of data on the burden of disability to inform the education sector plans and a lack of knowledge on how to include them in education planning and implementation remain a challenge. (UNICEF 2013)

Recommendations for future research

This report found out that disability rate of 3.5% is lower than the WHO expected range of 6-15% at county level. This was largely due to the use of a disability measure that lacked comprehensiveness. This study therefore recommends that future studies should use the widely recommended Washington group set of questions to measure disability. In addition, the report notes that the census data is limited in terms of questions on disability and did not include questions related to access to healthcare or existing social protection systems for persons with disability. This is a limitation to our understanding on how disability affects the comprehensive facets of development. This study recommends that future studies should be comprehensive enough to include all dimensions of development to enable us gauge the extent to which disability affects and is affected by the various facets of development.

While this analytical report clearly demonstrates that there is a negative association between disability and education or employment on the one hand, and a positive association between disability and poverty on the other hand, the pathways through which these associations operate remains grey in the Kenyan context. This study therefore recommends that future studies should adopt mixed methods to shed more light on the pathways through which disability affects or is affected by the different dimensions of development. Further, there is need for the use of longitudinal studies to help us investigate the question of causation since snapshot data such as the census and single round surveys can only help us describe and demonstrate associations rather than causation.

The effect of disability on the different dimensions of development can only be as much as its onset. We therefore recommend that future studies should include questions on the timing of disability to enable a full understanding on how disability impacts on development.

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