Novel Approaches for Evidence-Based Health Policies for Women of Reproductive Age:–
Small Area Estimation of Population Data.

Opeyemi O. Babajide [1]
[1] Department of Epidemiology and Medical Statistics, University of Ibadan, Nigeria.
opeyemilatona@gmail.com

Ayokunle Olagoke [2]
[2] Department of Community Health Sciences, University of Illinois, Chicago, United States of America.

ABSTRACT

With increasing demographic transition and change in population dynamics, there is a need to delineate population data to accommodate the heterogeneity of various socio-demographic groups. In Africa, women of reproductive age differ by risks process, urbanization, and geopolitical regions, which provides a challenge for policy implementation. In many instances, reproductive health policies are rather generic; they are extended to all women of reproductive ages and do not account for disparities among vulnerable rural women. Consequently, since challenges and choices differ for women in rural environments, pooling programs and intervention without adaptive solutions,

This current study explores the use of existing population data to demonstrate the disparity in reproductive health experiences/outcomes of women in various residential settings in Nigeria. This provides a baseline for measuring the progress of reproductive health interventions.

We included all 38,948 responses of women of reproductive ages into the weighted analysis of the 2013 Demographic and Health survey for Nigeria dataset. The explorative analysis was carried out to explore the experiences of these women, considering their places of residence.

There were 480 maternal deaths reported by the respondents, among their siblings. There were 44,623 live births in the three years preceding the survey. Also, our findings show a higher percentage of births and maternal deaths happened in rural areas compared to the urban areas. About 71.0 % of the maternal deaths observed in the dataset, were reported by women who lived in rural places of residences. Additionally, 70.6 % of all the births reported in the survey were from women who resided in rural environments.

This study has successfully provided a disaggregated approach which would serve as a baseline for formulating tailor-made reproductive health policies in Nigeria. It can be deduced that the experiences of women of reproductive years differ by several factors, one of which is the type of their places of residence. According to WHO, 515,000 women die globally due to pregnancy-related causes. Nigeria contributes a burden of 14% and 71% of those deaths occur in rural Nigeria. This suggests a need for decentralization of health policies to focus on women in the rural environments.

As the choice is the highest form of empowerment, decentralization of reproductive health policies, program, and intervention should harness the option of an evidence-based empowerment approach. This would result in more effective interventions and programs for rural women. This inclusion, in turn, breeds acceptance and confidence that transforms rural women into powerful developmental tools to their household and communities. This may also lessen the burden of maternal deaths and reproductive health challenges emerging from the rural area. The effects of these ripples into gender equality, child health and survival and enhanced female educational outcomes that can reduce poverty.

Considering the health disparities in the different segment of population, there is an urgent need to move towards the development of adaptive intervention and population disaggregation in the improvement of decision makings. This approach calls for investment in health information

infrastructures which would provide more real time data to explore despite progress, there is the challenge of incomplete or non-existing data. It would require the intervention of South-South Cooperation (SSC) partnership to improve our health surveillance systems which would enhance the quality of data to evaluate the impact of interventions to track the progress on achieving the SDGs.

Introduction

> *"Scientifically-sound evidence about sexual and reproductive health and rights is crucial for constructive dialogue, informed policy, and impactful programs. More than delivering analysis, we must build an evidence base that meets the needs of policymakers and respects the rights of individuals to receive quality care."*
>
> *-Julia Bunting, President, Population Council*

The Sub-Saharan Africa (SSA) region has persistently recorded the highest maternal morbidity and mortality despite global efforts[1]. Moreover, there has been a notable disparity in the coverage of reproductive health services. Significant and persistent health differences exist among and within countries, sub-regions, economic groups, race, and ethnic groups across Africa. Health differences also exist in individuals' access to quality healthcare[2]. Therefore, preferentially improving the health of the underserved may offer practical solutions that will reduce the reproductive health disparity among mothers and children.

Although African countries have made momentous achievements on reproductive health through the auspices of the millennium development goals (MDGs); which was later succeeded by the Sustainable Development Goals (SDG), the progress has been has been heavily impeded by unevenness[3] with a wide health difference by economic, demographic, geographic, geopolitical and epidemiologic transitions. An example is a wide disparity by places of residence (rural/urban) where the odds of antenatal health visits are two times higher among urban women compared to rural women[4]. There have also been challenges of poor data management and integrations, which has further imposed a substantial restriction on our understanding of the extent and inferential usability of the problem[5]. This restriction can further weaken the use of the available evidence as proxies for estimating the reproductive health status of the region, resulting in variability of maternal health status, which are unaccounted for.

In the same vein, measuring health disparity has gained attention on the agenda of the post-2015 sustainable goals. The World health organization (WHO) has, from inception in 1948, been known for encouraging health inequality monitoring[6]. The basics of the health monitoring systems make use of disaggregated data to identify disadvantaged subgroups within populations and inform health policy makers make equity oriented programs and practices. Disparities in maternal health exist worldwide, within and across subpopulations. Current deliberations on best practices to curb the menace suggests collecting and analyzing data that reveal patterns and trends of maternal inequality across subgroups in a population. Measuring maternal health inequality across different subgroups in a population has, most times, not been a common practice. More attention has been on getting the population estimate right. However, ensuring there are no disparities in the access to maternal health care in different subpopulations can assist in getting disaggregated estimates that can enhance decentralization of policies and interventions. There is a current emphasis on a need to disaggregate data by variables such as socio-economic status, geographical area, or even sex in the aim to reinforce data monitoring and accountability[7]. However, there is still weakness in the health information systems of several developing and low and middle-income countries. The long term solution to this would be to have substantial investments made in the health information and surveillance infrastructures of the countries. However, in the interim, existing data can be innovatively analyzed to provide sub-population estimates useful for monitor purposes.

SDG target 17 and 18 calls for countries to increase the availability of disaggregated data as part of the aim to strengthen data monitoring and accountability. This effort cuts across all the other goals to ensure implemented interventions are monitored, and their impacts are evaluated across the population. Data disaggregation allows for small area estimation of population data, which in turn enhances the demonstration and monitoring of health disparities in the population.

Health disparity is a worldwide challenge and can be remedied with the way data are collected to accommodate disaggregated analysis that can reveal patterns of inequalities across the population. It has been identified as the most crucial determinant of health status that could potentially be shaped by policies[6]. Hence, this study further strengthens the need to create a fusion of health policy and data usability. This can be accomplished by delineating population data to accommodate the heterogeneity of various socio-demographic groups and also leverage on this disaggregation to create policies that are not generic but rather specific, accounting for the disparities among vulnerable rural women. Consequently, since challenges and choices differ for women in rural environments, pooling programs, and interventions without adaptive solutions, may impede the purpose of empowering women.

Objective and Methodology

We set out on this research to demonstrate the disparity of trends in the experiences of women as regards their reproductive health. Despite the shortage of information in a developing country like Nigeria, We explored the use of the already existing household survey. The Nigerian Demography health survey is a robust dataset capturing information from women of reproductive ages across the country. Respondents were asked about their knowledge of family planning, health seeking behavior, birth histories, among others. Also, there was a maternal mortality module that captured information from the respondents to allow for estimation of maternal mortality in retrospect. The module captured information to explore the method called the "Siblings history" to provide the estimates of maternal mortality in the population using the direct sisterhood method. Respondents were asked to provide information for the children ever born to the natural mother. The names of each of the siblings are provided from the oldest to the youngest, with which the interview proceeded to find out more details about each of the siblings. The current age of the siblings was required as well as the marital status, for living siblings. The age at death and year since death is asked for siblings that are reported to be dead. Female siblings who were above the age of 15 are further probed about. The interviewer asks if the sister died during pregnancy, childbirth, or during the postpartum period. The women individual recode dataset was used for the analysis, and the weight of the dataset was considered to get the total population size that each sampled individual represented. The dataset was then disaggregated to carry out the exploratory analysis to demonstrate the different experiences of women who lived in urban and rural residential areas. The dataset was later converted to a panel-year data to have each reported sibling as an observation to be able to calculate the maternal mortality.

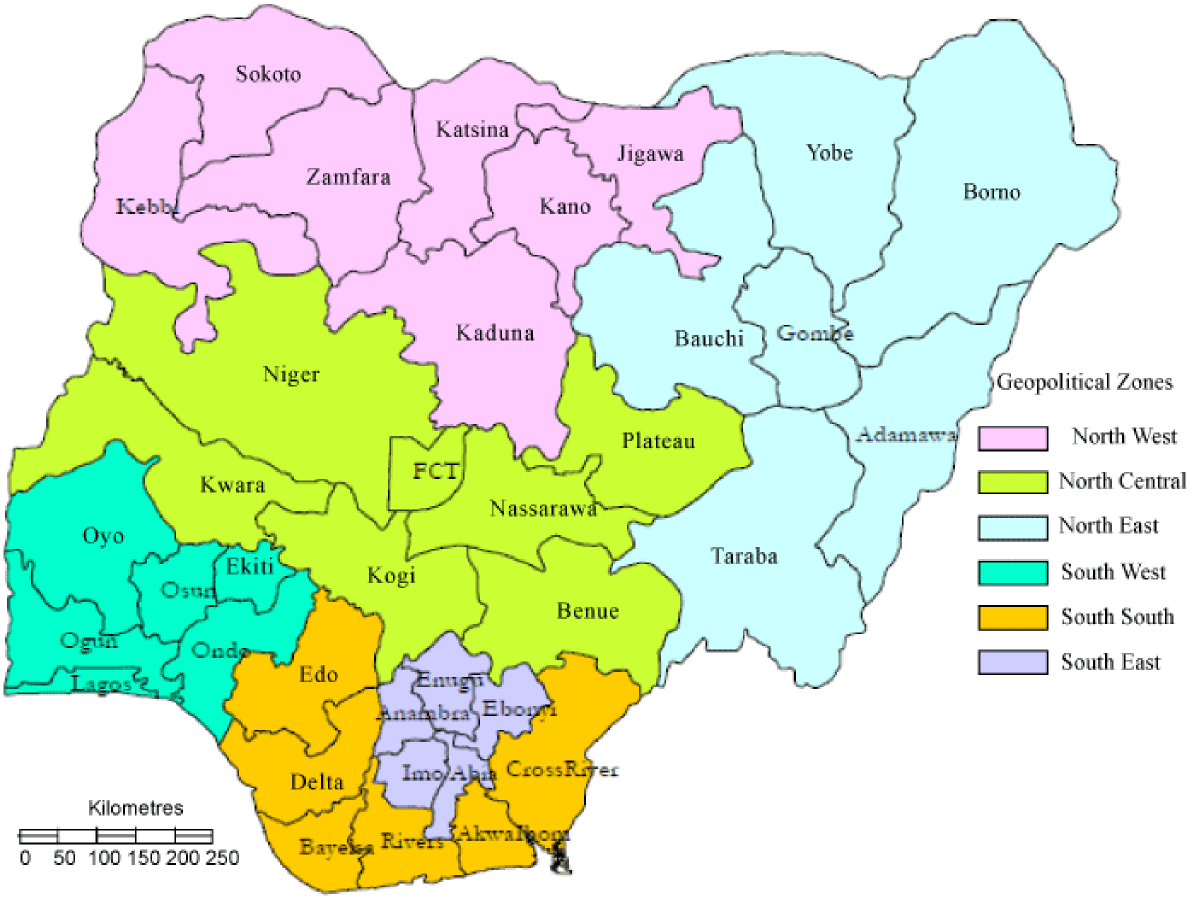

Figure 1: Map of Nigeria showing the states of the Federation and Federal Capital Territory.

RESULT

Out of 38,948 respondents in the survey, 57.9% were from the rural residential area across the six geopolitical zones.

Table 1: Education level and Family planning knowledge and usage

N-=38,948	42.1 **Urban**	57.9 **Rural**
No Education	15.5	54.1
Current pregnancy not wanted	46.2	53.8
Knows no method of family planning	16.4	83.6
Not visited health facility in the last 12 months	36	64
Not told about FP at the health facility	49.4	50.6
Sexual Violence in last 12 months	34.6	65.4
Husband with multiple partners	9.4	21.3

The larger percentages of women in the rural residential area reported having no education. It was also observed that about 53.8% of the women who were pregnant at the time of the survey had unwanted pregnancies. This is no shock as about 84% of the women did not know any family planning methods whatsoever (Table 1). Most of the women, 64%, had not visited the health facility in the last 12 months preceding the survey. Of the women who had attended a health facility 50.6% recorded that they were not sensitized about any method of family planning.

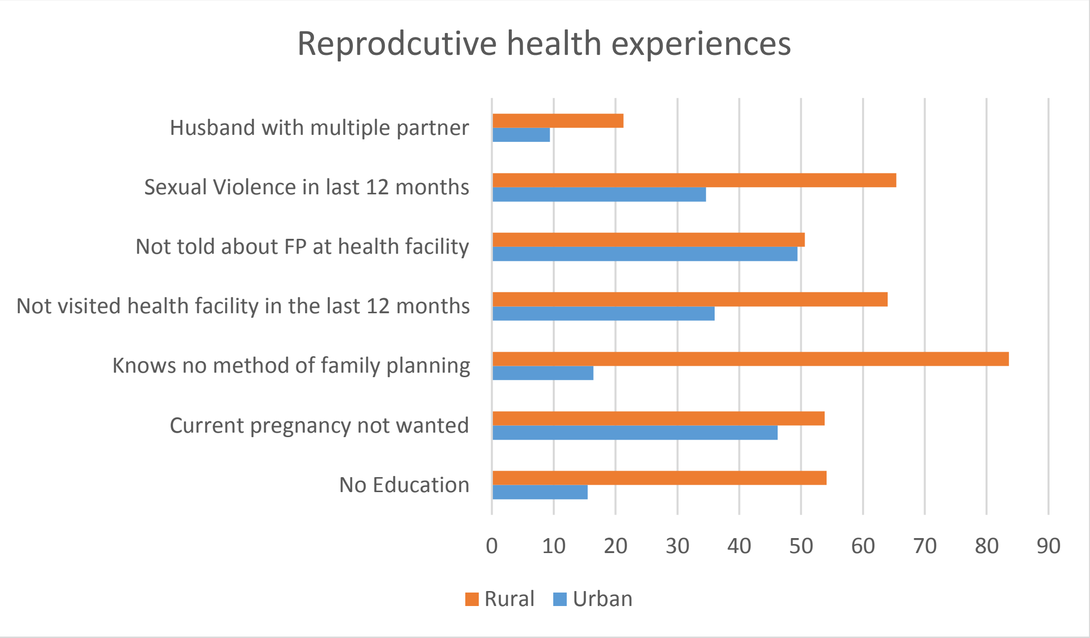

Figure 2: Chart comparing the Education level and Family planning knowledge and usage for women in a rural and urban residential setting

Table 2: Usage of Family planning methods and Reproductive health-seeking behavior of women in urban and rural areas

	Urban	Rural
Currently using a modern method	26.8	8.5
Currently using any modern method	16.9	5.7
Mothers received antenatal care for last birth	86	46.5
Births with skilled attendant at delivery	67	22.7
Ever experienced any sexual violence	6.8	7.8

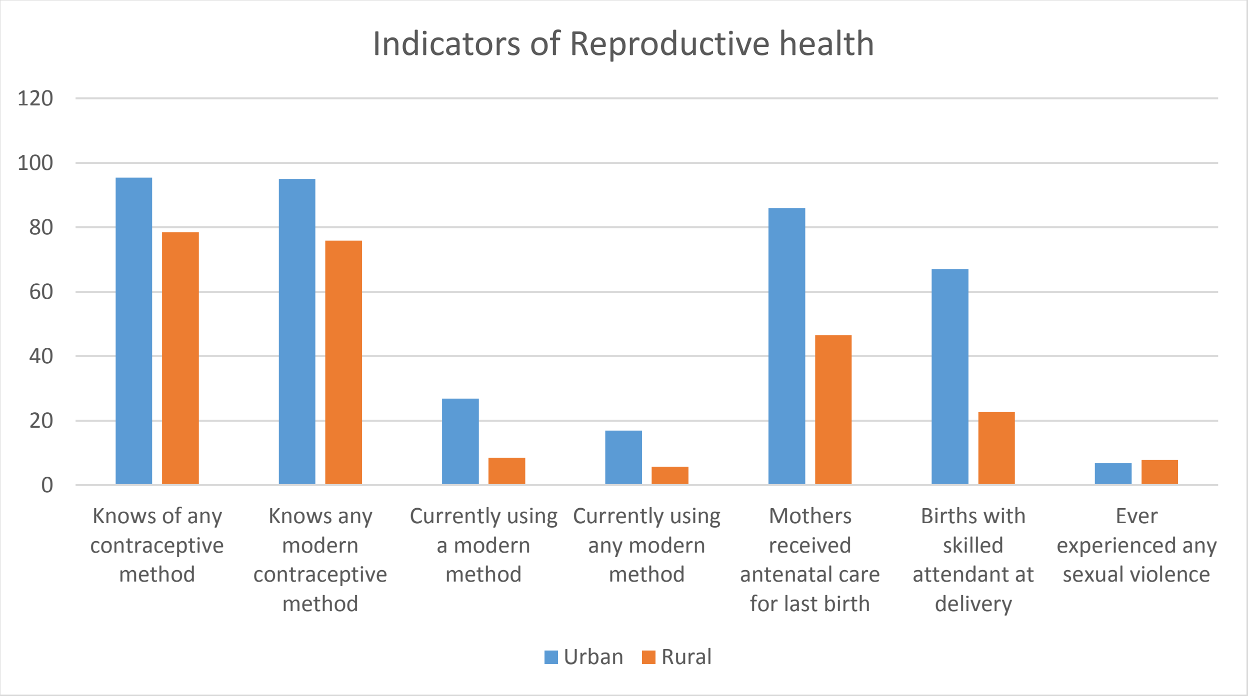

Figure 3: Chart comparing the Usage of Family planning methods and Reproductive health-seeking behavior of women in urban and rural areas

There were 480 maternal deaths reported by the respondents, among their siblings (Table 3). There were 44,623 live births in the three years preceding the survey. Also, our findings show a higher percentage of births and maternal deaths happened in rural areas compared to the urban areas. About 71.0 % of the maternal deaths observed in the dataset, were reported by women who lived in rural places of residences. Additionally, 70.6 % of all the births reported in the survey were from women who resided in rural environments.

Table 3: Adult female deaths and maternal deaths in seven years preceding the survey as reported by sisters.

	Urban	Rural	Total
Adult Female deaths	648.37	865.46	**1513.83**
Maternal deaths	173.35	306.59	**479.94**

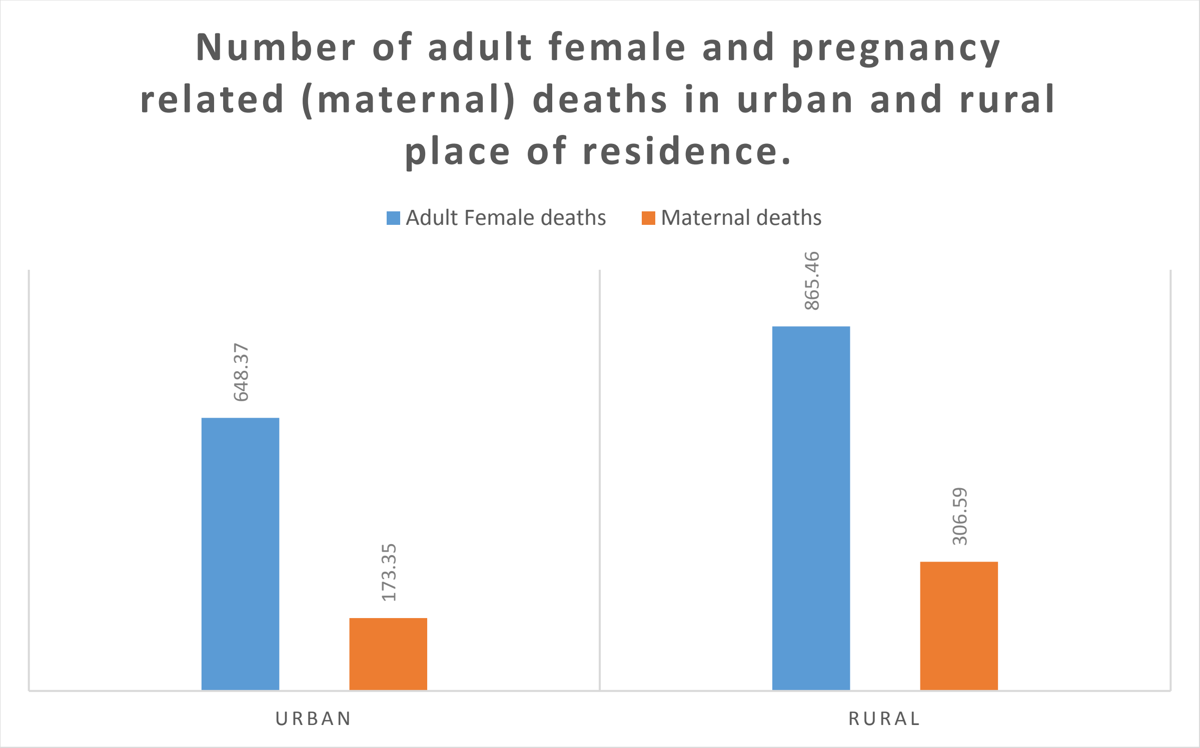

Figure 4: Chart comparing the adult female deaths and maternal deaths as reported in rural and urban residential settings.

DISCUSSION

One of the hallmarks of the International Conference on Population and Development agenda is putting women's empowerment, reproductive health, and rights at the heart of development. More focused is not on policy-makers, government a, researchers and scientists to focus on ensuring sexual and reproductive health care is not only of quality but also of scientific evidence, tailor-made and available for everybody. Ensuring this inclusion will mean to meet the sexual and reproductive health needs of women, girls, marginalized, and hard-to-reach populations, which is where rural women fall. It is widely accepted that actions that improve the sexual and reproductive health of women of reproductive ages not only varies across the age groups but also from countries, communities, and other subpopulations as applies. According to WHO, even though there will be a common thread, actions and programmes for each subpopulation should be guided by evidence drawn from scientifically-sound research.

Reproductive health policies are guidelines to solve a basic human problem for all women of reproductive ages. Some of the policies and strategies that have been made include expanded coverage of comprehensive prenatal, obstetric, post-partum and newborn care, expanded access to effective contraception, Expanded recruitment or training of skilled birth attendants and Government support for family planning support to mention a few. These have all been adopted in Nigeria. However, there is a challenge for the underserved communities in rural residential areas. As seen in this study, the women in rural areas were recorded in a high proportion of not been told of family planning at any of their visits to health facilities. This will explain why a large number of respondents had unwanted pregnancies as at the time of the survey. While most urban women recorded a better experience than their rural counterparts, it will be better if some equity can be attained to ensure the burden contributed by rural women is reduced.

Furthermore, as women in the rural area recorded that a large proportion of them was not informed about family planning during a visit to the health facility, this might need further investigation, intervention to know if there were adequate trained personnel at the health facility that can introduce FP to a woman visiting.

CONCLUSION

The advancement in sexual and reproductive health will rely greatly on evidence and interpretable facts for policies and implementation. In other to develop effective, evidence-based programs and policies that support rural women's sexual and reproductive health, additional data is needed. Continuous provision should be made to ensure that real-time data are collected and analyzed to inform decision before policies or are made and programs are designed. These evidences are essential to develop quality programs, intervention and policies. Guess games are not the best option in the sight of limited and valuable resources. This is of utmost importance if under-served people will be captured in the SDGs and not left behind. The inclusion of rural women and adolescent girls in the fulfillment of the sexual and reproductive rights remains an aspiration for millions across the globe. About 800 women die every day in childbirth, as health care providers also struggle with clear clinical decisions. We need to create more data opportunities for explore[8].

PRACTICE AND POLICY IMPLICATION

Policy-makers urgently need evidence to justify legislation and policies and for programme planning. Health researchers have powerful tools in influencing polices for sexual and reproductive health. However, it should be noted that facts will not speak for themselves. The ensure that appropriate strategies and tactics are used in the inclusion of women in rural areas and other underserved population in evidence-based interventions, political will must be endeared with information that is interpretable and translational. The ideas must be understandable, interesting within the context of the institutions making the policies. These tasks should not be taken likely but rather fast an essential part of the advancement of sexual and reproductive health to leave no one behind.

This ultimately calls for a need to improve information gathering system. The revamp of the health information system will help in ensuring that data is gathered with disaggregation in mind. This will enhance researchers in analysis for all subpopulation and provide evidence-base for future interventions that can infect be tailor-made. This consequently will mean that in the face of funding challenges, intervention can be concentrated on those that need it the most.

Further disaggregation can be done, exploring more explicit and robust small area estimation of demographic and population data. Data can be disaggregated to cover several segment of underserved people including humanitarian settings.

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