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RESEARCH ARTICLE

Knowledge of HIV and other sexually transmitted infections and place of delivery among urban women in South-West Nigeria

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ABSTRACT

Introduction: HIV and other Sexually Transmitted Infections (STIs) pose serious risks to health security especially to women, therefore, knowledge of their complications and attitude toward sexual health is important in planning preventive and treatment strategies among women in Nigeria. This study aims to assess the knowledge of HIV and other STIs and its association with the choice of place of delivery among urban women in south west Nigeria.

Methods: Data for urban women in south-west Nigeria was collected from National Demographic Survey (DHS) 2018. It evaluated their knowledge of HIV and other STIs in relation to the location of most recent childbirth. Chi-square ($\chi 2$) test and binary logistic regression analysis were conducted to establish association between variables using SPSS.

Result: 4604 women were surveyed. Some (21.9%) of the respondents had poor knowledge of HIV and other STIs. Women who had secondary school education were 1.7 times and 2.6 times more likely to have knowledge of HIV and other STIs respectively (OR=1.737; p<0.001; CI=1.402 - 2.153; OR=2.604; p<0.001; CI=1.934 - 3.507). Women who delivered their first child in public healthcare facilities were 1.7 times more likely to have good knowledge of HIV and STIs (OR=1.674; p<0.001; CI=1.233 - 2.275).

Conclusion: Women education and choice of place of delivery are important factors for knowledge of HIV and other STIs among urban women. Therefore, it is essential to implement more educational programmes specifically targeted at less educated women in urban regions of Nigeria.

Introduction

Knowledge of STI and their complications and attitude toward sexual health are important in planning preventive and treatment strategies (1). Level of knowledge of adult and reproductive health, including STDs tend to be higher in societies where people enjoy greater degree in freedom of communication, seek health advocacy, and engage in peer communication (2-4). Most of the people may be aware about HIV/AIDs because of the awareness created by media and government programs; however, knowledge about STIs other than HIV/AIDS do not get such attention and consequently, are not recognized (5).

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Sexually transmitted diseases (STDs) increase the likelihood of HIV transmission as well as other reproductive health consequences, such as chronic lower abdominal pain, infertility or life -threatening pregnancies. Most STIs are asymptomatic and go unnoticed and untreated. Both symptomatic and asymptomatic STIs can cause serious morbidity, including pregnancy complications, cancer, infertility, and enhanced HIV transmission (6). However, HIV prevalence continues to be high among women of reproductive age, and transmission of HIV from mother to child (MTCT) is a major concern and remains a public health priority (7-8). Childbearing is an important event in the life of most women and is positively associated with the ultimate goals of happiness, completeness, and family integration (9).

The place of delivery chosen by women is therefore very important with health facility being the most ideal (10). The choice of delivery place has consistently been found to be associated with maternal and neonatal outcomes (11). Various factors impact the choice of women regarding the place of delivery, some of which are out of their control (12). There is a dearth of literature on knowledge of HIV and other sexually transmitted infections and place of delivery among urban women. Hence, there is need for studies to investigate the level of knowledge of young women about STIs (13). Therefore, this study aimed to assess knowledge of HIV and other sexually transmitted infections and place of delivery among urban women in south west Nigeria.

Methods

DHS characteristics

National Demographic Survey (DHS) use largely standardized questionnaires and methodologies and cover a range of topics, including socio-economic, demographics; reproductive, maternal and child health; family planning, sexual behaviour and nutrition. The surveys are nationally representative and include men and women aged 15–49 years old and children under the age of 5 years residing in non-institutional settings. Participants in the surveys were sampled following a three-stage stratified cluster design using a list of enumeration areas (EAs) obtained from the Nigerian 2006 population census. EAs are units selected systematically from localities that constitutes the Local Government Areas (LGAs) – subdivisions of the 36 administrative states that are classified under six developmental zones in Nigeria. For the 2018 NDHS used in this study, 4604 women were interviewed. These DHS reports are publicly available; datasets are accessible upon application including study aim and analytical plans from DHS MEASURE (https://www.dhsprogram.com/).

Variables

Outcome variable: Outcome variable was location of most recent childbirth. This was measured by asking the respondent about the place of delivery for the most recent childbirth, and was divided into home, public healthcare facility, private healthcare facility and others.

Explanatory variable: Explanatory variable was knowledge of HIV and other sexually transmitted infection.

Covariates/individual-level factors

Age was categorized into seven groups: 15–19years, 20–29 years, 30–39 years, 40–49 years

Education attainment was grouped into four bands: never been to school, primary, secondary and higher education.

Marital status: grouped into single, married, cohabiting, widowed, divorced, separated.

Husbands' education was grouped into: No education, primary, secondary, higher and don`t know.

Total children born was grouped into: 1–3 years, 4 – 6 years, 7 – 9 years, and 10 – 12 years.

Data Analysis

Data were analysed with Statistical Package for the Social Sciences (SPSS) version 25. Women who have had a childbirth during past five years were included in the analysis. The main advantage of this method is that it mimics certain characteristics of randomized controlled trials and thereby minimises the bias due to non-randomisation in observational studies. Knowledge of HIV and other sexually transmitted infection was calculated. Following descriptive analysis, Chi-square ($\chi 2$) test was performed to check for the significant associations between the explanatory variables and place of delivery. Variables that were found to be significantly associated in the $\chi 2$ tests (at $p < 0.25$) were selected for final regression analysis. In the final step, binary logistic regression model was used to calculate the odds ratios

(OR) of the associations between knowledge of HIV and other STIs and place of delivery.

Results

Socio-demographic Characteristics of Respondents

The mean age of the respondents is 30.4±9.4 years. Some of the respondents (33.1%) were between 30 – 39 years of age, 59.9% had secondary education, and 50.9% of the respondents' partners had secondary education. Many (58.6%) were married, 90.5% had been in one union, 43.8% had between 1 – 3 children and 51.5% were involved in sales. Almost half of the respondents (47.8%) had their first delivery at a public health facility, also, 48.2% had their second child in a public healthcare facility. Some (17.1%) delivered their third child at home while many (58.6%) had their fourth child at home **(Table 1).**

Table 1: Socio-demographic Characteristics of Respondents (n=4064)

Variable	Frequency (n)	Percent (%)
Age		
15 – 19	649	16.0
20 – 29	1265	31.1
30 – 39	1344	33.1
40 – 49	806	19.8
Highest Level of Education		
No education	197	4.8
Primary	507	12.5
Secondary	2433	59.9
Higher	927	22.8
Partners Level of education		
No Education	155	6.0
Primary	290	11.2
Secondary	1322	50.9
Higher	801	30.9
Don't know	27	1.0
Current Marital Status		
Single	1241	30.5
Married	2382	58.6
Cohabitating	213	5.2
Widowed	94	2.3
Divorced	26	0.6
Separated	108	2.7
Number of Unions (n=2823)		
Once	2554	90.5
More than once	269	9.5
Parity		
None	1241	30.5
1 – 3	1781	43.8
4 – 6	894	22.0
7 – 9	144	3.5
10 – 12	4	.1
Occupation		
Professional/technical/managerial	599	18.5
Clerical	92	2.8
Sales	1668	51.5
Services	460	14.2
Skilled manual	276	8.5
Unskilled manual	5	0.2
Agricultural	135	4.2
Place of delivery 1st birth		
Home	277	15.5
Public Healthcare Facility	855	47.8
Private Healthcare Facility	540	30.2
Others	116	6.5
Place of delivery 2nd birth		
Home	81	14.0
Public Healthcare Facility	278	48.2
Private Healthcare Facility	177	30.7
Others	41	7.1
Place of delivery 3rd birth		
Home	12	17.1
Public Healthcare Facility	33	47.1
Private Healthcare Facility	22	31.4
Others	3	4.3
Place of delivery 4th birth		
Home	1	33.3
Public Healthcare Facility	2	66.7

Knowledge of HIV and other sexually transmitted infections

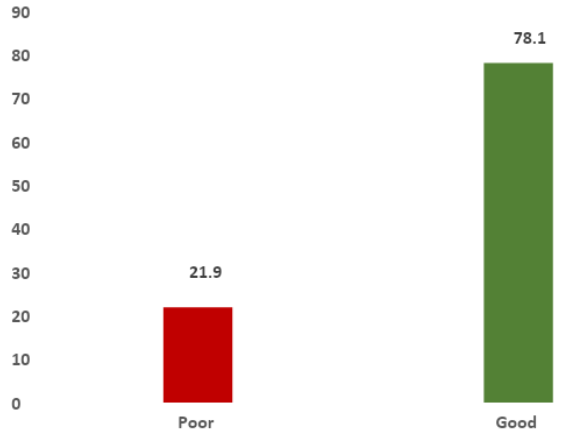
Almost all the respondents (96.3%) had ever heard of sexually transmitted infections (STIs). All of the respondents said that not having sex at all reduces the risk of getting HIV, most (80.6%) mentioned that

use of condoms during sex reduces the risk of getting HIV and majority (88.0%) said that having one sex partner only who has no other partners reduces the risk of getting HIV. Many of the respondents (72.9%) reported that HIV can be contracted from mosquito bites, 76.0% agreed that HIV can be contracted by sharing food with a person who has AIDS, while 76.3% reported that HIV can be gotten by witchcraft or supernatural means. Also, most of the respondents (88.1%) stated that a healthy-looking person can have HIV, 23.7% stated that a wife was not justified to ask the husband to use a condom if he has STI, some respondents (33.2%) would use drugs to avoid HIV transmission to baby during pregnancy and many (69.7%) would not buy vegetables from a vendor with HIV (Table 3). Overall, 21.9% of the respondents had poor knowledge of HIV and other sexually transmitted diseases while 78.1% had good knowledge of HIV and other sexually transmitted diseases **(Table 2, Figure 1).**

Table 2: Knowledge of HIV and other sexually transmitted infections

Variable	Frequency (n)	Percent (%)
Ever heard of sexually transmitted infection (STI)	3913	96.3
Reduced risk of getting HIV: do not have sex at all	0	0.0
Reduced risk of getting HIV: always use condoms during sex	3276	80.6
Reduced risk of getting HIV: Have one sex partner only who has no other partners	3575	88.0
Can get HIV from mosquito bites	2961	72.9
Can get HIV by sharing food with person who has AIDS	3087	76.0
A healthy-looking person can have HIV	3579	88.1
Wife justified asking husband to use condom if he has STI	3242	79.8
Can get HIV by witchcraft or supernatural means	3102	76.3
Drugs to avoid HIV transmission to baby during pregnancy	2716	66.8
Would buy vegetables from vendor with HIV	1230	30.3

Figure 1: Respondents Knowledge on HIV and other sexually transmitted diseases



Association between socio-demographic characteristics and knowledge of HIV and STIs.

Chi-square analysis revealed that there was statistically significant difference between selected socio-demographic characteristics and knowledge of HIV and STIs. There was statistically significant association between age and knowledge of HIV and STIs (X2=34.479; p-value<0.001). Furthermore, chi-square analysis showed that there was statistically significant association between educational level and knowledge of HIV and STIs (X2=227.168; p-value = <0.001). There was statistically significant association between partner's level of education and knowledge of HIV and STIs (X2=73.302; p-value = <0.001). Also, a statistically significant difference was shown between parity and knowledge of HIV and STIs (X2=32.329; p-value = <0.001). Chi-square analysis found statistically significant association between current marital status and knowledge of HIV and STIs (X2=19.387; p-value=0.002) **(Table 3).**

Table 3: Association between Sociodemographic and Knowledge of HIV and STIs

Variables	Knowledge of HIV and STIs		df	X^2	p-value
	Poor n (%)	Good n (%)			
Age					
15-19	196 (30.2)	453 (69.8)	3	34.479	<0.001**
20-29	244 (19.3)	1021 (80.7)			
30-39	268 (19.9)	1076 (80.1)			
40-49	183 (22.7)	623 (77.3)			
Highest Educational Level					
No Education	85 (43.1)	112 (56.9)			
Primary	186 (36.7)	321 (63.3)	3	227.168	<0.001**
Secondary	549 (22.6)	1884 (77.4)			
Higher	71 (7.7)	856 (92.3)			
Partners Level of education					
No education	40 (25.8)	115 (74.2)			
Primary	95 (32.8)	195 (67.2)			
Secondary	315 (23.8)	1007 (76.2)	4	73.302	<0.001**
Higher	95 (11.9)	706 (88.1)			
Don't know	8 (29.6)	19 (70.4)			
Parity					
None	279 (22.5)	962 (77.5)			
1 – 3	962 (77.5)	1446 (81.2)			
4 – 6	223 (24.9)	671 (75.1)	4	32.329	<0.001**
7 – 9	53 (36.8)	91 (63.2)			
10 – 12	1 (25.0)	3 (75.0)			
Current marital status					
Single	281 (22.6)	960 (77.4)			
Married	485 (20.4)	1897 (79.6)			
Living with partner	68 (31.9)	145 (68.1)	5	19.387	0.002
Widowed	23 (24.5)	71 (75.5)			
Divorced	4 (15.4)	22 (84.6)			
No longer living together/separated	30 (27.8)	78 (72.2)			

*** Statistically Significant*

Association between place of delivery for first birth and knowledge of HIV and STIs

Chi-square analysis revealed that there was statistical significance between place of delivery for first birth and knowledge of HIV and STIs (X2=18.444; p-value<0.001). Chi-square analysis found that there was statistical significance between place of delivery for second birth and knowledge of HIV and STIs (X2=14.046; p-value=0.003) **(Table 4).**

Table 4: Association between Place of Delivery for Birth and Knowledge of HIV and STIs

Variables	Knowledge of HIV and STIs		Df	X^2	p-value
	Poor n (%)	Good n (%)			
Place of Delivery (1st Birth)					
Home	83 (30.0)	194 (70.0)			
Public Healthcare	174 (20.4)	681 (79.6)	3	18.444	<0.001**
Private Healthcare	93 (17.2)	447 (82.8)			
Others	23 (19.8)	93 (80.2)			
Place of Delivery (2nd Birth)					
Home	31 (38.3)	50 (67.1)			
Public Healthcare	65 (23.4)	213 (76.6)	3	14.046	0.003**
Private Healthcare	30 (16.9)	147 (83.1)			
Others	10 (24.4)	31 (75.6)			

*** Statistically Significant, p-value <0.05*

Influence of Socio-demographic Characteristics on Knowledge of HIV and STIs

Logistic regression analysis revealed that those between 30-39 years were 1.7 times more likely to have knowledge of HIV and STIs as compared to those between 15-19 years (OR=1.737; p<0.001; CI=1.402 - 2.153). Also, those who had secondary school education were 2.6 times more likely to have knowledge of HIV and STIs compared to those who had no education (OR=2.604; p<0.001; CI=1.934 - 3.507). Partners who had higher education were 2.6 times more likely to have knowledge of HIV and STIs compared to partners who had no education (OR=2.585; p<0.001; CI=1.701 - 3.929). Those who had between 1-3 and 7-9 children were 1.3 times more likely and 50.2% times less likely to have knowledge of HIV and STIs compared to those who had no children respectively (OR=1.252, p=0.014, CI=1.047 - 1.497; OR=0.498, p<0.001, CI=0.346 - 0.717). Furthermore, respondents living with a partner were 37.6% times less likely to have knowledge of HIV and STIs as compared to those who were single (OR=0.624; p=0.004; CI=0.454 - 0.857) **(Table 5).**

Table 5: Factors Affecting Knowledge of HIV and STIs

Variables	Sig.	OR	95% Confidence Interval
Age			
15-19 **(Ref)**	-	-	-
20-29	<0.001**	1.810	1.456 - 2.252
30-39	<0.001**	1.737	1.402 - 2.153
40-49	0.001**	1.473	1.164 - 1.863
Highest Educational Level			
No Education **(Ref)**	-	-	-
Primary	0.114	1.310	0.937 - 1.831
Secondary	<0.001**	2.604	1.934 - 3.507
Higher	<0.001**	9.150	6.310 - 13.268
Partners Level of Education			
No education **(Ref)**	-	-	-
Primary	0.129	0.714	0.462 - 1.103
Secondary	0.586	1.112	0.759 - 1.628
Higher	0.000**	2.585	1.701 - 3.929
Don't Know	0.678	0.826	0.336 - 2.034

Table 5 *(continued)*

Variables	Sig.	OR	95% Confidence Interval
Parity			
None **(Ref)**	-	-	-
1 – 3	0.014**	1.252	1.047 - 1.497
4 – 6	0.186	0.873	0.713 - 1.068
7 – 9	0.000**	0.498	0.346 - 0.717
10 – 12	0.904	0.870	0.090 - 8.397
Current Marital Status			
Single **(Ref)**	-	-	-
Married	0.111	1.145	0.970 - 1.352
Living with partner	0.004**	0.624	0.454 - 0.857
Widowed	0.684	0.904	0.554 - 1.473
Divorced	0.385	1.610	0.550 - 4.710
No longer living together/separated	0.225	0.761	0.489 - 1.184

** Statistically Significant; Ref: Reference

Discussion

The study was carried out among 4064 urban women between in the reproductive age (15-49 years of age). Some of the respondents (33.1%) were between 30 – 39 years of age while 59.9% had secondary education. HIV and other sexually transmitted infections (STIs) constitute major public health concerns in Africa and particularly in Nigeria. A comprehensive knowledge of the modes of transmission is necessary to evolve an effective preventive strategy. Almost all the respondents (96.3% and 95.6%) in this study had heard of STIs and AIDS respectively. Similarly, around 90% of respondents in another study had heard about HIV/acquired immune deficiency syndrome (AIDS) (14). Also, 21% of the women had poor knowledge of HIV and other sexually transmitted diseases while 78.1% had good knowledge of HIV. The high level of awareness in this study may be due to various interventions including the health education provision by Nigeria's HIV/AIDS control program (National Action Committee on AIDS) through radio jingles, print and electronic media. Contrary to the result of this study, in a similar study among rural dwellers in Nigeria, only 13.1% of the participants had knowledge of STIs (15). This shows that there might be a difference between the knowledge of HIV among urban and rural women in Nigeria. Although, the disparity in the knowledge could be related to the peculiarities of the rural areas where means of disseminating information may not be as efficient as in the urban (14). Low STI knowledge has been shown to be connected with unsafe sex practices and HIV (16). It was observed in the current study that most of the respondents practiced safe sex; and majority (88.0%) had one sex partner only who had no other partners. This may be as a result of the observed high knowledge of HIV and other STIs among the study respondents.

Misconceptions about HIV transmission are still prevalent in Sub Saharan Africa, despite recent significant improvements in public awareness of the disease (17). An analysis of women's knowledge of HIV in Nigeria revealed that while awareness of HIV/AIDS was generally high among the population, accurate knowledge on HIV transmission was generally low; only 24% of a total of 9882 people had comprehensive knowledge of modes of HIV transmission (18). This study reported some misconceptions about the transmission of HIV. Many of the respondents (72.9%) reported that HIV can be contracted from mosquito bites,76.0% agreed that HIV can be contracted by sharing food with a person who has AIDS, while 76.3% reported that HIV can be gotten by witchcraft or supernatural means. Similar results were reported by Nahar et al. (19), where about 60% of the respondents believed that HIV could be transmitted through the mosquito bite. Also, studies in Kenya and Ghana discovered that some respondents believe the HIV virus could be spread through mosquito bites and touching an infected person (20). In addition, the view that a healthy-looking person cannot be HIV positive or that HIV can be cured by sleeping with a virgin, eating

fresh vegetables, and making ancestral sacrifices is still a notion in many parts of SSA (21-22). This clearly shows that a major gap in knowledge exists among urban women about the means of transmitting/ acquiring HIV and other STIs. The need for targeted education at eradicating myths and misconceptions about HIV transmission may be emphasized, given that some urban women reported a good HIV knowledge, yet still hold on to misconceptions about HIV transmission.

This study found a statistically significant association between age and knowledge of HIV and STIs. Respondents between 30-39 years were 1.7 times more likely to have knowledge of HIV and STIs as compared to those between 15-19 years. In agreement to the result of this study, findings from the 2012 survey showed increasing odds of good knowledge of both STIs and HIV infections with age (23). The proportion of participants with good knowledge of STIs including HIV infections was high among those aged 25–49 years in the 2005 and 2007 surveys particularly those from the Northeast region of Nigeria (23). On the contrary, good knowledge of STIs was associated with being a male in the 2007 survey report (24).

Logistic regression analysis also found that those who had secondary school education were 2.6 times more likely to have knowledge of HIV and STIs compared to those who had no education. Lan et al. (24) also found that higher education resulted in good knowledge of HIV and other STIs. Also, according to Lan et al. (24) women with low education or low economic status had less knowledge of STI than those with higher education or economic category. Also, those who had between 6-10 children were 54.8% times less likely to have knowledge of HIV and STIs compared to those who had between 1-5 children. The World Health Organization (WHO) lists education as one of the key determinants of health and explains that higher education levels are linked with better health outcomes (25). Knowledge of HIV and other STIs among the respondents was significant associated with partner's level of education. Partners with higher (tertiary) education were 2.6 times more likely to have good knowledge of HIV and other STIs. More-educated people typically have stronger socio-cognitive abilities, leading to better ability to assimilate risk information and higher self-efficacy to act on such knowledge. Also, more-educated individuals tend to have more income and thus more control over their lives and ability to act on knowledge; they also tend to place higher value on the future and thus be more motivated to take preventative measures (26-27).

Furthermore, respondents' marital status was statistically significant with marital status. Respondents that were currently living a partner were 37.6% less likely to have good knowledge of HIV and other STIs. However, previous studies have established that Marital status was significantly associated with the seroprevalence of HIV and the odds of being HIV-infected were two times higher among formerly married women compared with other women (28).

The current study found that almost half of the respondents (47.8%) had their first delivery at a public health facility. There was statistical significance between place of delivery for first birth and knowledge of HIV and STIs. Women who delivered their first child in public healthcare centres were 1.7 times more likely to have knowledge of HIV and STIs as compared to those who delivered their first child at home. Likewise, those who delivered their second child in private healthcare centres were 3.0 times more likely to have knowledge of HIV and STIs as compared to those who delivered their second child at home. This could be attributed to the sensitization and awareness programmes for pregnant women on HIV and other STIs during ante-natal visits to such facilities. Respondents with 1 – 3 children were 1.3 times more likely to have good knowledge of HIV and other STIs.

Conclusion

This study found that almost all urban women in South West Nigeria had heard of sexually transmitted infections (STI) and majority had good knowledge of HIV and other sexually transmitted diseases. However, some misconceptions about HIV and other STIs including contraction of HIV from mosquito bites, by sharing food with a person who has AIDS and by witchcraft or supernatural means were reported by some of the women. Also, most of the women had delivered their first and second birth in a public health facility. Significant association was established between the knowledge of HIV and age, level of education and place of delivery.

Recommendations

Based on the findings of this study, these recommendations were made

- There is need to intensify campaigns on HIV and other STIs transmission in the urban areas of Nigeria to debunk misconceptions about the transmission of HIV using both traditional methods of information dissemination and leveraging new media such as the social media.
- In order the bridge the gap in the knowledge of HIV, educational programmes on HIV and other STI should target more less educated women in urban regions of Nigeria.
- There is a need to articulate program, which include messages aimed at reinforcing safer sex practices for women who are already sexually active.
- Also, interventions should also be focused on women living with partners with a view to sensitizing them to the risk of HIV infection in order to increase the effectiveness of prevention strategies.

Limitations

However, a drawback in this study is the use of cross-sectional data, which is inadequate to establish causality. More so, the study utilized secondary data; therefore, measurement of certain variables such as exposure to behaviour change communication through HIV/AIDS-related interventions across various groups and over time was not possible. Finally, the use of composite index to measure knowledge and attitude as provided by DHS data could lead to estimation bias.

Ethical approval

The Nigerian DHS is conducted according to the local Nigerian research ethics requirements. Data for this analysis were accessed via the publicly available DHS data sets, with access granted through the DHS programme. As this was a secondary data analysis, further research ethics approval was not required; however, in accordance with DHS regulations, all data extracted from the NDHS for the purpose of this study were handled as confidential and survey respondents remained unidentified. This study conforms to the principles of the Declaration of Helsinki.

Availability of Data: The dataset used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interest: The authors declare that there is no competing interest.

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Authors contributions: IIO: Conceptualization, Resources, Writing—Original Draft, Writing—Review and Editing, Supervision and Project administration. MAA: Conceptualization, Resources, Writing—Original Draft, Writing—Review and Editing. TAA: Conceptualization, Resources, Review and Editing. RIO: Conceptualization and Review.

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