# Awareness, knowledge, and factors that influenced the uptake of screening tests for prostate cancer among men aged 40 and older in Ido-Ekiti, Ekiti State, Nigeria 

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#### Abstract

Background. Despite being the second most common and deadliest cancer in males, prostate cancer could go unnoticed in the


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early stages. Prevention programs have been set in place to help in the early detection and reduction of mortality rates in developed countries.

Objective. The aim of this study was to determine awareness, knowledge, and the uptake of prostate cancer screening tests. Another objective was to identify the factors that determine the uptake of prostate cancer screening among men living in Ido-Ekiti.

Methods. A cross-sectional study was conducted among males aged 40 and above living in Ido-Ekiti in Ido-Osi local government area, Ekiti State, Nigeria. The sample size of 380 respondents was obtained using Leslie Fisher's formula.

Results. The study revealed that the majority of the correspondents are aware of prostate cancer (57.9\%). More than two-thirds of the respondents have poor knowledge of prostate cancer and the screening test $(74.4 \%)$, with a median knowledge score of $30 \%$. The uptake of prostate cancer screening tests was very low among the respondents (18.2\%).

Conclusion. Despite the high level of awareness of prostate cancer disease among the respondents, the majority have poor knowledge of the disease and the screening test. There was a low uptake of prostate cancer screening tests among the respondents.

## Introduction

Prostate cancer is the most commonly diagnosed malignancy among elderly males. ${ }^{1}$ It is the second most frequent malignancy after lung cancer in men worldwide, counting $1,276,106$ new cases and causing 358,989 deaths ( $3.8 \%$ of all deaths caused by cancer in men) in 2018. ${ }^{1,2}$ An estimated $3,245,430$ men were living with prostate cancer in the United State of America. In Nigeria, prostate cancer is the most commonly diagnosed malignancy among men and a hospital prevalence of 182.5 per 100,000 male admissions was recorded in 2010 in Osun State. ${ }^{3}$ Prostate cancer is generally considered a disease of the elderly and its incidence increases with age from the fifties onward. ${ }^{2}$ Only 1 in 350 men under the age of 50 will be diagnosed with prostate cancer, ${ }^{4}$ incidence rate increases up to 1 in every 52 men for ages 50-59, with an incidence of nearly $60 \%$ in men over the age of 65 years. ${ }^{5}$ Worldwide, black men have the greatest risk of having this disease, followed by Caucasians. Low incidences have been reported among Asian and Oriental men.

If all cases of prostate cancer were diagnosed early, there will be a greater reduction in morbidity and mortality associated with the disease. Prostate cancer could go unnoticed in the early stages of the disease. In the advance or developed world, preventive programs have been put in place to help in the early detection and reduction of the mortality rate; however, in the developing or
underdeveloped world, the situation is the opposite. Early detection of prostate cancer requires an effective screening method. Checking for prostate-specific antigen and digital rectal examination, although these are not completely accurate, will help to detect prostate cancer early and take measures to prevent its progression among the population at risk.

Several studies on prostatic cancer have reported low uptake of prostate cancer screening tests (PSA). In a study carried out in Kenya, it was found that $5 \%$ of the respondents between 40-69 years uptake prostate cancer screening tests. ${ }^{6}$ Another study in Oyo State (Nigeria) reported a $16 \%$ uptake of prostate cancer screening tests among the respondents. ${ }^{7}$ A study in Ilorin, north-central Nigeria, reported a $7.1 \%$ uptake among the respondents. ${ }^{8}$ Low levels of awareness and knowledge, erroneous belief about the disease, and poor healthcare-seeking behavior of patients, among other factors related to available facilities and poverty, have been documented in previous studies as responsible for the low uptake of prostate cancer screening tests. Knowledge of the disease and uptake of prostate cancer screening remains indispensable in mitigating the dire consequences of the prevalent late presentation of patients with the disease in sub-Saharan Africa.

A study carried out in Sokoto, Nigeria, showed that only 5 and $1.3 \%$ of the respondents respectively were aware of prostate cancer and prostate cancer screening test; $95 \%$ had poor knowledge of prostate cancer and none has ever had a prostate cancer screening test done. ${ }^{9}$ Several studies have shown a relationship between sociodemographic/economic characteristics, cultural factors, and uptake of prostate cancer screening tests among men.

As demonstrated by Clarke in 2015, men with higher incomes were more likely to screen when compared with men with lower incomes. This is likely because of increased exposure to information about prostate cancer screening. The transportation to the screening site and the price of the screening test could also have an effect. ${ }^{10}$ Another study showed that married men were more likely to go for prostate cancer screening tests. The education level has also been found to influence the uptake of prostate cancer screening tests. Embarrassment and fear were factors that determine the participation of Nigerian men in the uptake of prostate cancer screening tests.

To the best of our knowledge, there is currently little or no systematic study on knowledge and factors that determine the uptake of prostate cancer screening tests among men aged 40 and older in Ekiti State, Nigeria. The data obtained from this study will help to formulate policies to improve the uptake of prostate cancer screening tests among men and to reduce morbidity and mortality associated with this disease. The study is aimed to study the uptake, awareness, knowledge, and factors that influence the uptake among men 40 years and above in Ido-Ekiti, Ekiti state Nigeria.

## Materials and Methods

## Study area

Ido-Ekiti is the headquarter of the Ido-Osi local government area of Ekiti State, Nigeria. The major occupations of the population include farming, trading, teaching, and civil service. It has two political wards. It has both public and private health centers that offer primary health care services in addition to a tertiary health center, (Federal Teaching Hospital Ido-Ekiti) where prostate cancer screening and management can be done.

## Study design

A cross-sectional descriptive study was conducted among males of 40 years and above living in the town.

## Target population and inclusion criteria

The target population was represented by males 40 years and above living in the town. The study included all the men above the age of 40 years who are willing to participate in the study.

## Sample size

The sample size was determined using the Leslie Fishers formula:

$$
n_{0}=\frac{Z^{2} p(1-p)}{e^{2}}
$$

where $\mathrm{n}_{0}$ is the sample size; $\mathrm{Z}=1.96$ for $95 \%$ level of confidence; p is the prevalence of proportion on men with a positive attitude towards prostate cancer screening uptake from a previous study of $55.3 \%(0.553)^{8} ; \mathrm{q}=1-\mathrm{p}=0.447$; e is the degree of accuracy desired usually set at 0.05

$$
\begin{gathered}
\mathrm{n}_{0}=\frac{1.96^{2} \times 0.553 \times 0.447}{\underline{0.05^{2}}} \\
\mathrm{n}_{0}=\frac{3.8416 \times 0.553 \times 0.447}{0.0025} \\
\mathrm{n}_{0}=\underline{0.9496} \\
0.0025 \\
\mathrm{n}=380
\end{gathered}
$$

## Data collection method/sampling technique

A multistage sampling technique was used to select eligible participants. The technique was in 4 stages: i) one out of the 2 political wards in Ido-Ekiti was selected by balloting (ward 2); ii) 4 settlements were picked from ward 2 by simple random sampling (Oke-Isoko, Ijemu, Inisa, Isolo); iii) one street was selected in each of the settlements picked in stage ii by balloting; iv) the houses along each of the streets selected in stage iii were numbered and followed by a generation of household listing for each of the streets selected in stage iii; v) household listing generated for each street in stage 4 served as a sampling frame for the selection of the households for the study. Eligible respondents in the selected household were interviewed until the required sample size was obtained for each of the streets. Equal numbers of respondents were selected in each of the streets.

## Study instrument and its reliability

The instrument used for data collection in the course of this research was an interviewer-administered semi-structured questionnaire. The reliability of the instrument was determined by administering it. Thirty-eight copies of the questionnaire, which is $10 \%$ of the sample size of men above 40 years of age in another community in the Ido-Osi local government area, was administered. Next, ambiguous questions were rephrased, and the flow of questions was modified within 2 weeks.

## Data collection procedure

The eligible respondents were informed about the purpose of the study. Verbal consent was obtained before the completion of the questionnaire.

## Data management and analysis

All data collected were sorted, coded, and analyzed using IBM (International Business Machine) and SPSS (Statistical Package
for the Social Sciences) statistics version 25 using inferential statistics. Categorical variables were presented as percentages, proportion, and frequency tables. Bivariate and multivariate analysis was done using chi-square and Fisher's exact test.

## Ethical considerations

Ethical approval was obtained from the ethical committee of Federal Teaching Hospital Ido-Ekiti, Ekiti State, Nigeria with protocol number ERC/2020/10/14/425B. Informed consent was obtained from all respondents, and confidentiality was ensured.

## Results

A total of 371 questionnaires were administered in this study to identify the factors that determine the uptake of prostate cancer screening amongst men living in Ido-Ekiti in Ido/Osi Local Government Area of Ekiti State, Nigeria. Out of these, 340 were filled, returned, and analyzed, indicating an attrition rate of $8.3 \%$.

Table 1 shows some socio-demographic characteristics of the respondents. More than two-thirds of the respondents (70.6\%) were between the ages of $40-59$ years. The majority of the respondents were married $(72.9 \%)$, and close to half of the respondents
( $45 \%$ ) had tertiary education. The predominant ethnic group among the respondents is the Yoruba ethnic group ( $88.8 \%$ ). Close to a third of the respondents were civil servants ( $32.3 \%$ ). The majority of the respondents were Christians (about $80.3 \%$ ). Close to half of the respondents earn within $10,000-50,000$ naira monthly $(46.5 \%)$ and live in a one-two bedroom accommodation (41.5\%).

Table 2 shows that more than half of the respondents were aware of prostate cancer ( $57.9 \%$ ). $38.2 \%$ of the respondents knew that smoking was a risk factor for prostate cancer, while $6.8 \%$ knew that consumption of red meat was a risk factor. $78.5 \%$ of the respondents agreed that an increase in the frequency of urination is a symptom of prostate cancer, while $81.2 \%$ agreed that poor flow of urine is a symptom of prostate cancer. The majority of the respondents $(80.6 \%)$ agreed that prostate cancer can be screened for. Table 3 shows that most of the respondents have poor knowledge about prostate cancer ( $74.4 \%$ ) with a median knowledge score of $30 \%$. Respondents' knowledge of the disease was assessed based on their responses to questions asked on factors that prevent or favor the onset of prostate cancer and symptoms of prostate cancer. Respondents that answered half or more of the questions correctly were considered to have good knowledge.

Table 4 shows that a large percentage ( $81.8 \%$ ) of the sample size had not been screened for prostate cancer. Out of the respondents that had been screened, $74.2 \%$ were screened between the

Table 1. Socio-demographic characteristics of respondents.

|  | Frequency N=340 | Percentage (\%) |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { Age group } \\ & 40-59 \\ & 60 \text { and above } \end{aligned}$ | $\begin{aligned} & 240 \\ & 100 \end{aligned}$ | $\begin{gathered} 70.6 \\ 29.4 \end{gathered}$ |
| Mean age $\pm$ standard deviation | $53.7 \pm 11.4$ |  |
| Marital status Married Single Separated Divorced | $\begin{gathered} 248 \\ 27 \\ 42 \\ 23 \end{gathered}$ | $\begin{gathered} 72.9 \\ 7.9 \\ 12.4 \\ 6.8 \end{gathered}$ |
| Level of education <br> Primary <br> Secondary <br> Tertiary | $\begin{gathered} 81 \\ 106 \\ 153 \end{gathered}$ | $\begin{aligned} & 23.8 \\ & 31.2 \\ & 45.0 \end{aligned}$ |
| Ethnic group Yoruba Non-Yoruba | $\begin{gathered} 302 \\ 38 \end{gathered}$ | $\begin{aligned} & 88.8 \\ & 11.2 \end{aligned}$ |
| Occupation <br> Trading Farming Civil servant Artisan Retiree Unemployed | $\begin{gathered} 56 \\ 48 \\ 111 \\ 91 \\ 25 \\ 9 \end{gathered}$ | $\begin{gathered} 16.1 \\ 14.1 \\ 32.6 \\ 26.8 \\ 7.4 \\ 2.6 \end{gathered}$ |
| Religion Christianity Islam Traditional | $\begin{gathered} 273 \\ 54 \\ 13 \end{gathered}$ | $\begin{aligned} & 80.3 \\ & 15.9 \\ & 3.8 \end{aligned}$ |
| $\begin{aligned} & \text { Estimated income per month (Naira) } \\ & \quad<10,000 \\ & 10,000-50,000 \\ & >50,000-100,000 \\ & >100,000 \end{aligned}$ | $\begin{aligned} & 36 \\ & 158 \\ & 86 \\ & 60 \\ & \hline \end{aligned}$ | $\begin{aligned} & 10.6 \\ & 46.5 \\ & 25.3 \\ & 17.6 \end{aligned}$ |
| Your type of accommodation One-two bedroom Three bedroom Compound house Duplex | $\begin{aligned} & 141 \\ & 85 \\ & 76 \\ & 38 \end{aligned}$ | $\begin{aligned} & 41.5 \\ & 25.0 \\ & 22.4 \\ & 11.1 \\ & \hline \end{aligned}$ |

ages of 40 and 60 , while $8 \%$ were screened before the age of 40 and $8 \%$ after the age of 60 . Out of the population that had not been screened, $53.6 \%$ do not plan on being screened, the reasons mostly being that they do not see a need for it $(43.6 \%)$, followed by fear of getting diagnosed (17.4\%), financial constraint ( $16.1 \%$ ) and family influence constituting the least reason (3.4\%). Close to half of the respondents $(44.7 \%)$ do not know how often they should be screened for prostate cancer.

The relationships between the socio-demographic characteristics of respondents and their uptake of prostate cancer screening tests is shown in Table 5. The age of the respondents, level of education, and estimated income per month were found to be statistically related with the following P values, respectively $\mathrm{P}=0.007$, $\mathrm{P}<0.001$ and $\mathrm{P}=0.001$.

The relationship between respondents' uptake of prostate cancer screen tests and their knowledge about prostate cancer was statistically significant ( $\mathrm{P}<0.001$ ). About $36.8 \%$ of respondents adjudged to have good knowledge had screened for prostate cancer compared to only $11.9 \%$ of those with poor knowledge.

Respondents who were at least 60 years old were about 4 times more likely to have done prostate cancer screening in the past than their counterparts under 60 [adjusted odds ratio (AOR) $=3.733$; $95 \%$ confidence interval (CI)=1.837-7.584]. Also, respondents
with a tertiary education were about 12 times more likely to have had a prostate cancer test than those who had only attended a primary school (AOR=11.716; 95\% CI=3.544-38.735). In addition, respondents who were earning above 100,000 nairas a month had about thrice more likelihood of ever having the screening done than those earning less than 10,000 nairas (AOR $=2.899 ; 95 \%$ $\mathrm{CI}=1.209-5.448$ ). Finally, respondents who had good knowledge about prostate cancer were about thrice more likely to have ever done a prostate cancer screening than those with poor knowledge of it ( $\mathrm{AOR}=2.811 ; 95 \% \mathrm{CI}=1.404-5.625$ ).

## Discussion

Only $59.7 \%$ of all respondents were aware of prostate cancer. The reason for this may be because of the slightly increased level of literacy in this area and the fact that Ido-Ekiti has a major tertiary hospital situated in it where the patients from the area, who accessed care in that facility, were educated about prostate cancer. This finding is similar to the outcome of a study carried out in Nairobi (Kenya) on prostate cancer awareness, knowledge, perception of self-vulnerability and uptake of screening among men which observed that a higher number of the respondents (84.6\%)

Table 2. Awareness and knowledge of prostate cancer among respondents.

|  | Frequency $\mathrm{N}=340$ | Percentage (\%) |
| :---: | :---: | :---: |
| Ever heard of prostate cancer? |  |  |
| Yes | 197 | 57.9 |
| No | 143 | 42.1 |
| What may favor the onset of prostate cancer? |  |  |
| High-fat diet | 66 | 19.4 |
| Smoking | 130 | 38.2 |
| Older than 50 years | 93 | 27.4 |
| Alcohol | 77 | 22.7 |
| Obesity | 75 | 22.1 |
| Family history | 28 | 8.2 |
| Red meat consumption | 23 | 6.8 |
| What can prevent the onset of prostate cancer ( $\mathrm{n}=197$ )? |  |  |
| Physical activity | 67 | 19.7 |
| Low-fat diet | 63 | 18.5 |
| Vitamin D/E intake | 52 | 15.3 |
| Fruit and vegetable intake | 86 | 25.3 |
| Needing to urinate excessively at night is a symptom |  |  |
| True | 286 | 84.1 |
| False | 54 | 15.9 |
| Increased frequency of urination is a symptom |  |  |
| True | 267 | 78.5 |
| False | 77 | 21.5 |
| Poor flow of urine is a symptom |  |  |
| True | 276 | 81.2 |
| False | 64 | 18.8 |
| I am aware that prostate cancer can be screened for |  |  |
| Yes | 274 | 80.6 |
| No | 66 | 19.4 |

Table 3. Respondents' level of knowledge about prostate cancer.

| Variable | Frequency $\mathbf{N}=340$ | Percentage (\%) |
| :--- | :---: | :---: |
| Knowledge about prostate cancer |  |  |
| Good $(\geq 50 \%)$ | 87 | 25.6 |
| Poor $(<50 \%)$ | 253 | 74.4 |
| Median knowledge score $(\%)$ | 30.0 |  |

Article

Table 4. Assessment of uptake of prostate cancer screening test.

| Variable | Frequency $\mathbf{N = 3 4 0}$ | Percentage (\%) |
| :--- | :---: | :---: |
| Ever had prostate cancer screening done (uptake)? |  |  |
| Yes | 62 | 18.2 |
| No | 278 | 81.8 |
| When, if YES (n=62) |  |  |
| Less than 40 | 8 | 12.9 |
| 40-60 | 46 | 74.2 |
| Greater than 60 | 8 | 12.9 |
| If NO, are you willing to have it done? (n=278) |  |  |
| Yes | 129 | 46.4 |
| No |  | 53.6 |
| Reason (s), if NO (n=149) | 65 | 43.6 |
| Don't see the need for it | 24 | 16.1 |
| Financial constraint | 26 | 17.4 |
| Fear of getting diagnosed with prostate cancer | 5 | 3.4 |
| Family influence |  | 12.1 |
| How often should we be screened? | 41 | 15.6 |
| Once in a lifetime | 53 | 27.6 |
| Every 10 years | 94 | 44.7 |
| As recommended by my physician | 152 |  |
| I don't know |  |  |

Table 5. Socio-demographic variables and uptake of prostate cancer screening.

| Variable | Uptake of Yes n(\%) | eening No n(\%) | Chi-square | $P$ value |
| :---: | :---: | :---: | :---: | :---: |
| Age group 40-59 60 and above | $\begin{aligned} & 35(14.6) \\ & 27(27.0) \end{aligned}$ | $\begin{gathered} 205(85.4) \\ 73(73.0) \end{gathered}$ | 7.299 | 0.007 |
| Marital Status Married Single Separated Divorced | $\begin{aligned} & 41(16.5) \\ & 4(14.8) \\ & 9(21.4) \\ & 8(34.8) \end{aligned}$ | $\begin{aligned} & 207(83.5) \\ & 23(85.2) \\ & 33(78.6) \\ & 15(65.2) \\ & \hline \end{aligned}$ | 5.205 | 0.157 |
| Level of education Primary Secondary Tertiary | $\begin{gathered} 4(4.9) \\ 7(6.6) \\ 51(33.3) \end{gathered}$ | $\begin{aligned} & 77(95.1) \\ & 99(93.4) \\ & 102(66.7) \end{aligned}$ | 42.615 | <0.001 |
| Ethnic group Yoruba Non-yoruba | $\begin{aligned} & 56(18.5) \\ & 6(15.8) \end{aligned}$ | $\begin{gathered} 246(81.5) \\ 32(84.2) \end{gathered}$ | 0.172 | 0.679 |
| Occupation <br> Trading <br> Farming <br> Civil servant <br> Artisan <br> Retiree <br> Unemployed | $\begin{aligned} & 6(10.7) \\ & 9(18.8) \\ & 29(26.1) \\ & 13(14.3) \\ & 4(14.3) \\ & 1(11.1) \end{aligned}$ | $\begin{aligned} & 50(89.3) \\ & 39(81.2) \\ & 82(73.9) \\ & 78(85.7) \\ & 21(84.0) \\ & 8(88.9) \end{aligned}$ | 8.566 | 0.128 |
| Religion Christianity Islam Traditional | $\begin{gathered} 53(19.4) \\ 7(1.0) \\ 2(15.4) \end{gathered}$ | $\begin{gathered} 220(80.6) \\ 47(87.0) \\ 11(84.6) \end{gathered}$ | 1.332 | 0.514 |
| $\begin{aligned} & \text { Estimated income per month (Naira) } \\ & \quad<10,000 \\ & 10,000-50,000 \\ & >50,000-100,000 \\ & >100,000 \end{aligned}$ | $\begin{gathered} 3(8.3) \\ 25(15.8) \\ 12(14.0) \\ 22(36.7) \end{gathered}$ | $\begin{aligned} & 33(91.7) \\ & 133(84.2) \\ & 74(86.0) \\ & 38(63.3) \end{aligned}$ | 17.712 | 0.001 |
| Your type of accommodation One-two bedroom Three bedroom Compound house Duplex | $\begin{aligned} & 21(14.9) \\ & 21(24.7) \\ & 12(15.8) \\ & 8(21.1) \end{aligned}$ | $\begin{aligned} & 120(85.1) \\ & 64(75.3) \\ & 64(84.2) \\ & 30(78.9) \end{aligned}$ | 3.950 | 0.267 |

were aware of prostate cancer. ${ }^{6}$ However, this was not the case in two studies carried out in Uduth, Sokoto, ${ }^{9}$ and Idi-Araba, Lagos State, ${ }^{1}$ where the majority of the respondents were unaware of prostate cancer with an estimation of $95 \%,{ }^{9}$ and $54.7 \%,{ }^{11}$ respectively.

A large majority of the respondents have never had a prostate cancer screening done $(81.8 \%)$. The majority of the respondents that have not been screened were not willing to have it done. The reasons for their non-willingness, as shown in this study, include financial constraints, fear of getting diagnosed with prostate cancer, not seeing the need for the screening, and family influence. This is similar to the study conducted in Oyo, ${ }^{12}$ and the one in Sokoto, ${ }^{9}$ on risk perception and uptake of prostate cancer screening among a population of men where $92 \%$ and $98.6 \%$, respectively, have never had prostate cancer screening done. Only a small percentage of the respondents ( $18.2 \%$ ) have had prostate cancer screening done in this study. Poor awareness and knowledge of the disease and the screening test among the majority of the respondents as shown in this study might also be a contributory factor to the low uptake of prostate cancer screening tests among the respondents.

There is a statistically significant relationship between the following socio-demographic variables namely age, educational status, income of the respondents, and the uptake of prostate cancer screening test. These findings are similar to a study carried out in Zambia where advanced age, having secondary or tertiary education, and a family history of prostate cancer influenced the uptake of prostate cancer screening tests. ${ }^{13}$

Another study carried out in Lagos (Nigeria) identified financial constraints as one of the main barriers to the uptake of the prostate cancer screening test. Men with higher incomes were more likely to screen when compared with men with lower incomes because of increased exposure to information on prostate cancer and ease of transportation to the screening site. A higher level of education will help increase awareness and knowledge of prostate cancer and screening test. Education will improve the health-seeking behavior of the individual. There is a higher chance of developing prostate cancer and its symptoms with advancing age which may warrant seeking medical intervention. This explained why there is an increase in the uptake of prostate cancer screening tests with advancing age.

## Limitations

This study and its sample size were limited to a single local government in the State due to the non-availability of enough resources.

## Conclusions

The majority of the respondents are aware of prostate cancer. Generally, there was poor knowledge of the disease and the screening test among the majority of the respondents. The uptake of prostate cancer screening tests was generally low among the respondents. The majority of the respondents that had not been screened for prostate cancer expressed their non-willingness to go for screening. Financial constraints, fear of getting diagnosed with prostate cancer, not seeing the need for it and family influence were the identified reasons in the study for the respondents' nonwillingness. Age, educational status, and income of the respondents were important socio-demographic/economic variables that influenced the uptake of prostate cancer screening tests among the respondents.

## Recommendations

There is a need for the government at all levels to subsidize the cost of screening or if possible to make it free for all adults aged 40 and above. A certain amount of money should be set aside in the annual budgets of all three tiers of government for prostate cancer prevention and treatment strategies. There is a need for community sensitization on the need for every 40 years and above male adult to go for regular prostate cancer screening to assure that having prostate cancer is not a death sentence if detected very early. Community sensitization can be carried out through electronic media, print media, and health centers.

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