SPATIAL ANALYSIS OF CHRONIC KIDNEY DISEASE IN NIGERIA: CASE STUDY IN EDO STATE

THE HEART BEAT OF THE NATION

EDO STATE

By

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Overview

- **Chronic kidney disease (CKD)**

- **CKD in Nigeria**

- **Study area**

- **Study objectives**

- **Data collection**

- **Methods**

- **The impact of CKD awareness and diagnosed cases between 2006 and 2009**

- **Conclusion**

Chronic kidney disease (CKD)

- **This is a gradual loss of kidney function, usually taking months, or even years.**

- **The increased severity of CKD is divided into five stages**

- **The fifth stage is categorised as a total or near-total loss of kidney function, which results in a patient needing dialysis or a kidney transplant.**

- **The stages of CKD are determined by a measurement of the kidney's function known as glomerular filtration rate (GFR) (*emedicinehealth, 2008*)**

Table 1: Stages of Chronic Kidney Disease

Stage	Description	GFR mL/min/1.73m^2
1	Slight kidney damage with normal or increased filtration	More than 90
2	Mild decrease in kidney function	60-89
3	Moderate decrease in kidney function	30-59
4	Severe decrease in kidney function	15-29
5	Kidney failure requiring dialysis or transplantation	Less than 15

Source: http://www.emedicinehealth.com/chronic_kidney_disease/article_em.htm

Chronic kidney disease (CKD)

- **One in ten adults has some form of kidney disease**

- **Approximately 500 million persons worldwide (*World Kidney Day, 2008*)**

- **Prevalent in people from the African, and Asian decent as opposed to other ethnic groups (*Nwankwo et al, 2007; Kramer, 2006; US Renal Data System, 2005*).**

- **Financial provision for CKD management in the developed countries**

- **Impact on morbidity, mortality, and life expectancy of the population in developing countries (*Arogundade & Barsoum, 2008*).**

CKD in Nigeria

- **Nigeria does not have a reliable register or database to show the current impact of CKD on its population.**

- **An increase in the number of people that have been diagnosed with Kidney disease (*Alebiosu & Ayodele, 2005*).**

- **CKD prevalence is among patients aged between 20 and 50 years.**

- **The way forward is to focus on improving on the early detection of CKD in patents**

Source: © 1992 MAGELLAN Geographix,

Study area

•**Edo State shares boundaries with Delta state on the South, Ondo state on the West, Kogi state on the Northeast**

•**Benin City is the state's capital**

•**Consist of 18 geo-political units known as local government areas (LGA) with each L.G.A having an estimate of 10 wards.**
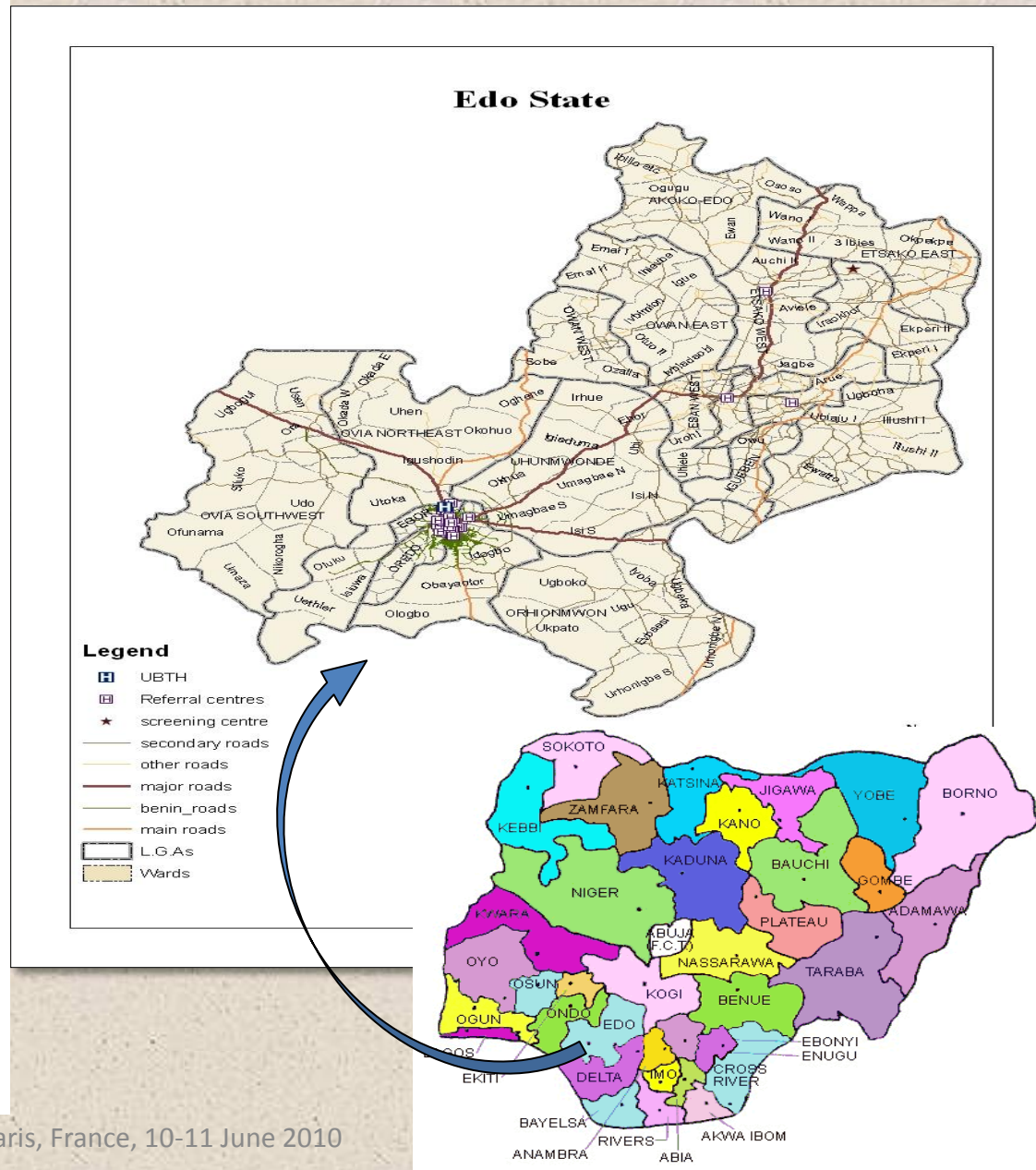
Study Objectives

- **To identify the geographical distribution of CKD across Edo State**

- **To evaluate the impact of the awareness of CKD within the state by examining the prevalence of CKD cases within Edo state between 2006 and 2009**

Data collection

- **CKD dataset provided by the University of Benin Teaching Hospital (UBTH)**

- **Base map data layers was provided by the Regional Centre for Training in Aerospace Surveys (RECTAS)**

Study Population

- **CKD patient in Edo State that were diagnosed from 2006 to the 14th of October 2009**

- **A total of 357 CKD cases from 2006 -2009**

- **Excluded cases**

Methods

- **Use of SPSS and Microsoft Excel programmes for quantitative analysis of CKD dataset**

- **Geocoding of data using EXPERTGPS and Google Earth™**

- **Use of ArcGIS to identify areas with high and low prevalence of CKD**

Descriptive statistics of data and profile of CKD patients in Edo State

- **Association between the males (229) and females (128) diagnosed with CKD differed significantly with a one degree of freedom = 1.00, p<0.001**

- **The mean age of the patients was 45.04±17.45years, p<0.05**

- **occupational structure of the CKD patients**

- **Stage of CKD at point of diagnosis**

Proportion of CKD cases at time of diagnoisis

Number of CKD cases

N/A	stage 2	stage 3	stage 4	stage 5
10	10	20	13	304
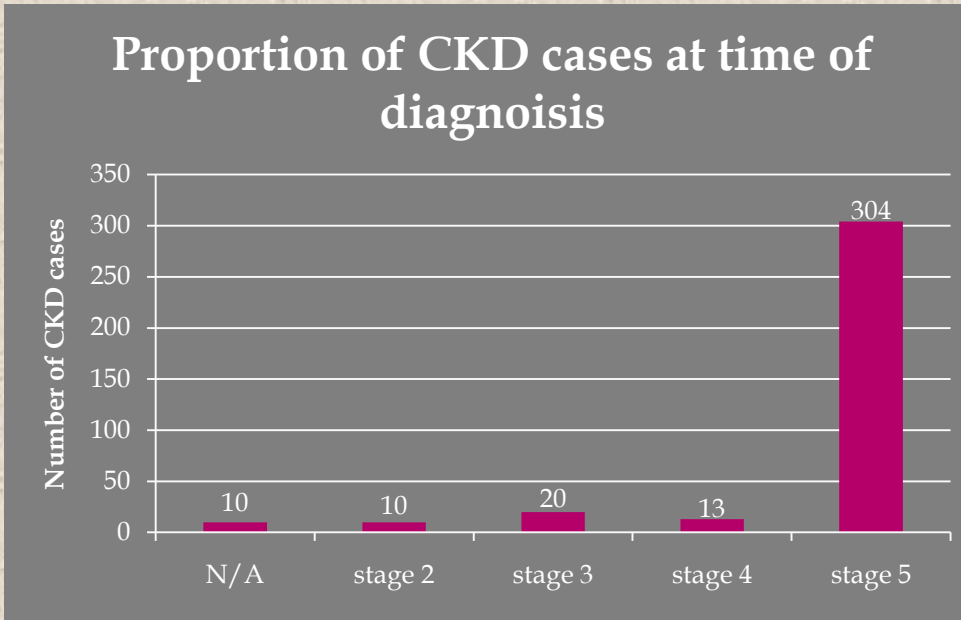
- **Risk factors present among CKD cases**

Proportion of risk factors amongst CKD patients

Chronic glomerulonephritis	Diabetes mellitus	Hypertension	toxic nephropathy
137	60	132	24

■ yes
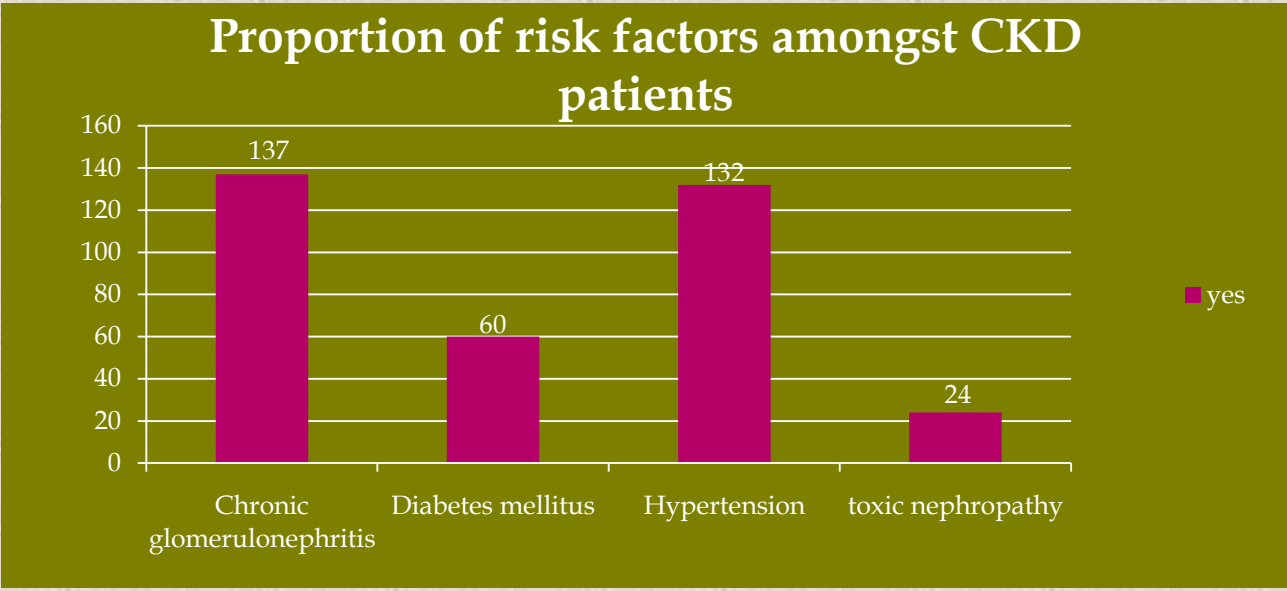
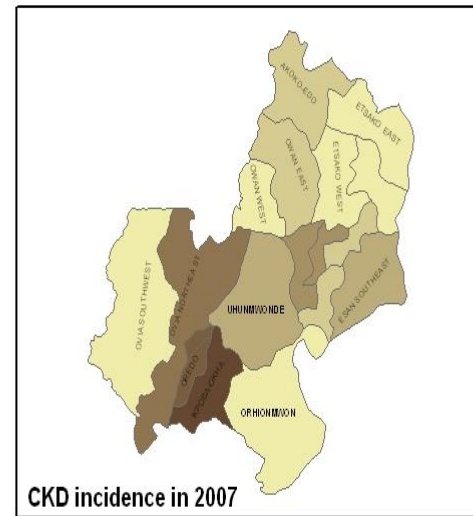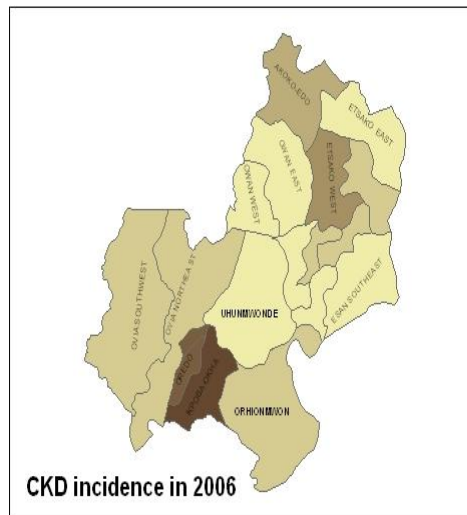# Geocoding of dataset from UBTH using Google Earth™

The impact of CKD awareness between 2006 and 2009

- **How aware are the health services to CKD?**

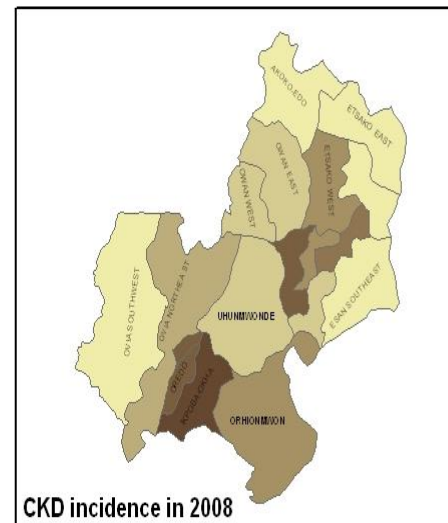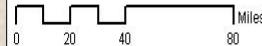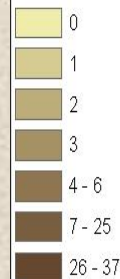CKD referral centres in relation to registered health centres in each L.G.A

Location of UBTH and Referral centres in Edo State

- **Spatial distribution of CKD cases within the L.G.As**

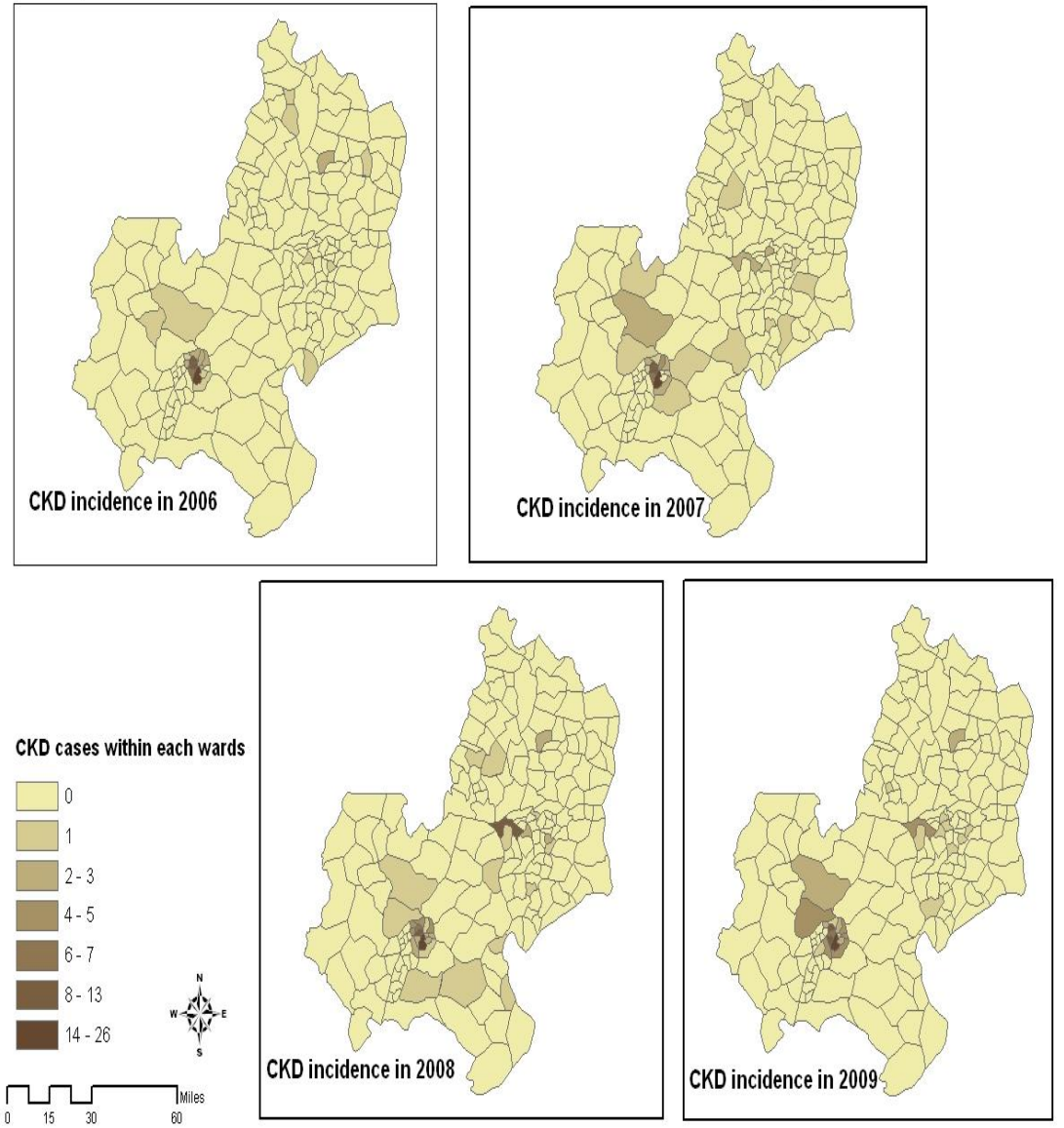The spatial distribution of new CKD cases within the L.G.As between January 2006 - October 2009

CKD incidence in 2006

CKD incidence in 2007

CKD cases within each LG.A
- 0
- 1
- 2
- 3
- 4 - 6
- 7 - 25
- 26 - 37

CKD incidence in 2008

CKD incidence in 2009
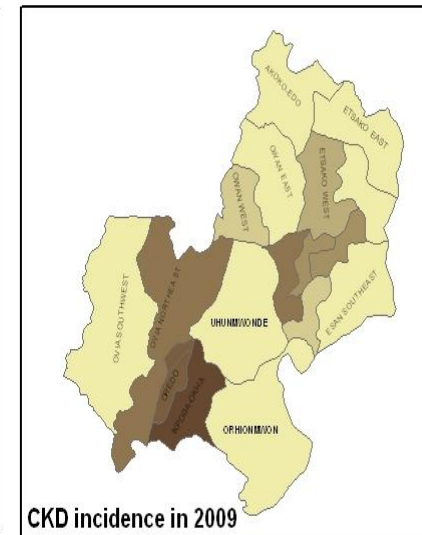
Spatial distribution of CKD cases within the wards

The spatial distribution of new CKD cases within the wards between January 2006 - October 2009

CKD incidence in 2006

CKD incidence in 2007

CKD cases within each wards

- 0
- 1
- 2 - 3
- 4 - 5
- 6 - 7
- 8 - 13
- 14 - 26

Miles
0   15   30   60

CKD incidence in 2008

CKD incidence in 2009

Early stage of CKD cases from 2006 to October 2009

- **Proportion of early stage CKD with stage 5 CKD between 2006 and 2009**

Proportion of early stage and late stage CKD cases
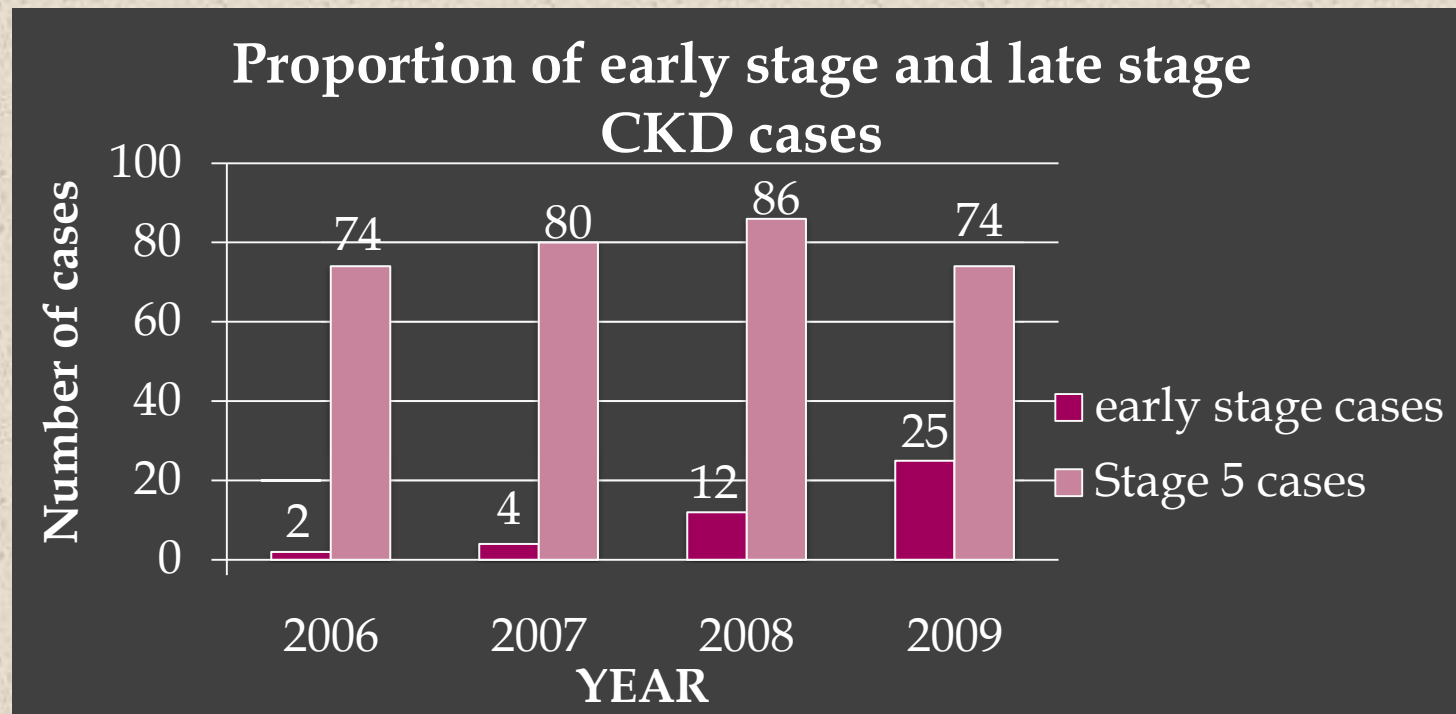
Conclusion

- **CKD diagnosis in urban and rural areas**

- **How effective has been the CKD awareness programmes within the state?**

CKD distribution within the wards and the location of large settlements within Edo State

Legend

□ LARGE SETTLEMENTS

CKD patients
- 0
- 1 - 3
- 4 - 6
- 7 - 8
- 9 - 11
- 12 - 15
- 16 - 39
- 40 - 83

THANK YOU