

# **Heterogeneity of Malaria in Kampala City, Uganda**

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# Background

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- Uganda is a high malaria endemic country.
- After Nigeria and the DRC, Uganda is # 3 in global contribution of malaria cases
- Significant heterogeneity of malaria is seen in the country, across regions, districts and even divisions/sub counties/cities.
- The urban settings i.e. Kampala City have generally low malaria burden. However, with increasing travel among others, burden has been increasing in the cities.
- A good understanding of spatial distribution of malaria in urban settings is therefore important for tailoring of interventions for urban malaria control.

# Methods

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- We analyzed routine HMIS (DHIS-2) data to
  1. Describe the epidemiology of malaria in Kampala
  2. Describe the distribution of cases by division and age group
  3. Compare trends in test positivity rate and incidence of malaria in Kampala city between 2020 and 2022.
  4. Map malaria service providers in Kampala
  5. Recommend areas for actions

# Results

- Kampala City is the Capital City of Uganda
- Made up of 5 divisions
  - Rubaga
  - Makindye
  - Nakawa
  - Central (Kampala Capital City Authority)
  - Kawempe
- Each division has a medical/public health department responsible for health matters of the population
- Services are provided in both public and private facilities.
- Population of Kampala City is: **1,738,600**



# Results

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# Distribution of malaria cases by division & gender

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<b>Division</b>	<b>Total Malaria</b>	<b>% Male</b>	<b>% Female</b>
Central Division	33009	52 (17168)	48 (15841)
Kawempe Division	34404	45.6 (15683)	54.4 (18721)
Makindye Division	45408	46 (20887)	54 (24521)
Nakawa Division	40690	44.8 (18213)	55.2 (22477)
Rubaga Division	39289	45.4 (17835)	54.6 (21454)

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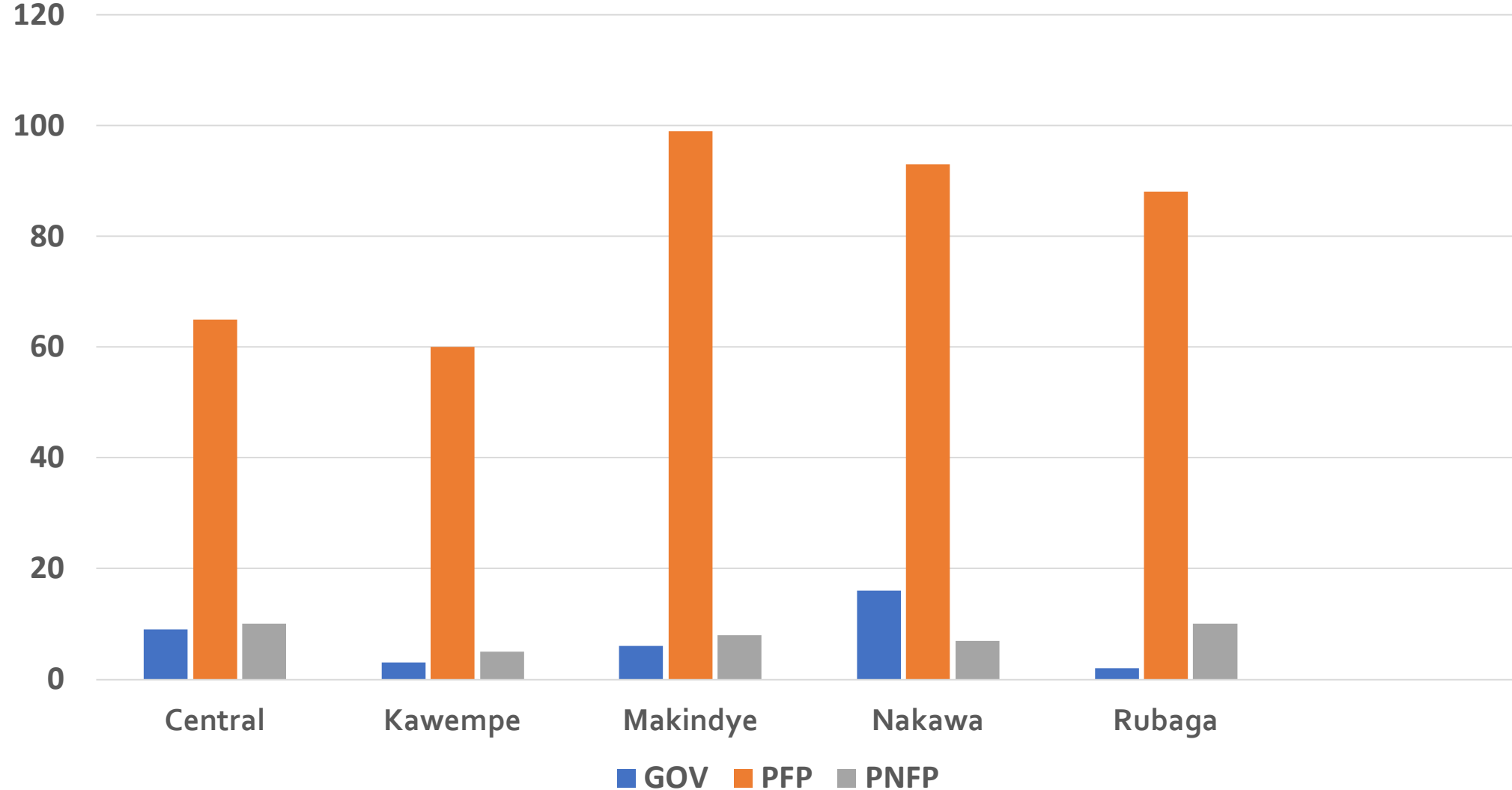
- Makindye, Nakawa and Rubaga divisions have the most malaria cases reported in the year 2022
- Most malaria cases were diagnosed in females in all divisions except Central division

# Age of malaria cases per Division

Division	Total Malaria	<u>u5s</u> %(N)	<u>5-9yrs</u> %(N)	<u>10-19yrs</u> %(N)	<u>20+ yrs</u> %(N)	<u>MIP*</u> %(N)
Central Division	33009	12 (3977)	12.7 (4206)	17 (5624)	57.2 (18896)	0.9 (306)
Kawempe Division	34404	18.8 (6471)	17.8 (6109)	21 (7216)	39.7 (13657)	2.8 (951)
Makindye Division	45408	18.6 (8424)	15.3 (6959)	21.3 (9679)	42.1 (19120)	2.7 (1226)
Nakawa Division	40690	15.8 (6419)	13.3 (5419)	19 (7714)	48.4 (19702)	3.5 (1436)
Rubaga Division	39289	21.7 (8539)	17.0 (6697)	21.4 (8409)	37.2 (14605)	2.6 (1039)

- Most cases are from Makindye division (45408) | least cases from Central division (33,009)
- In all divisions, adults 20years + contribute the most malaria cases in Kampala followed by 10-19 year olds
- The 5-9 year old age group had the least reported malaria cases in Kampala
- Very few cases of malaria in pregnancy are reported. Most are from Nakawa division.

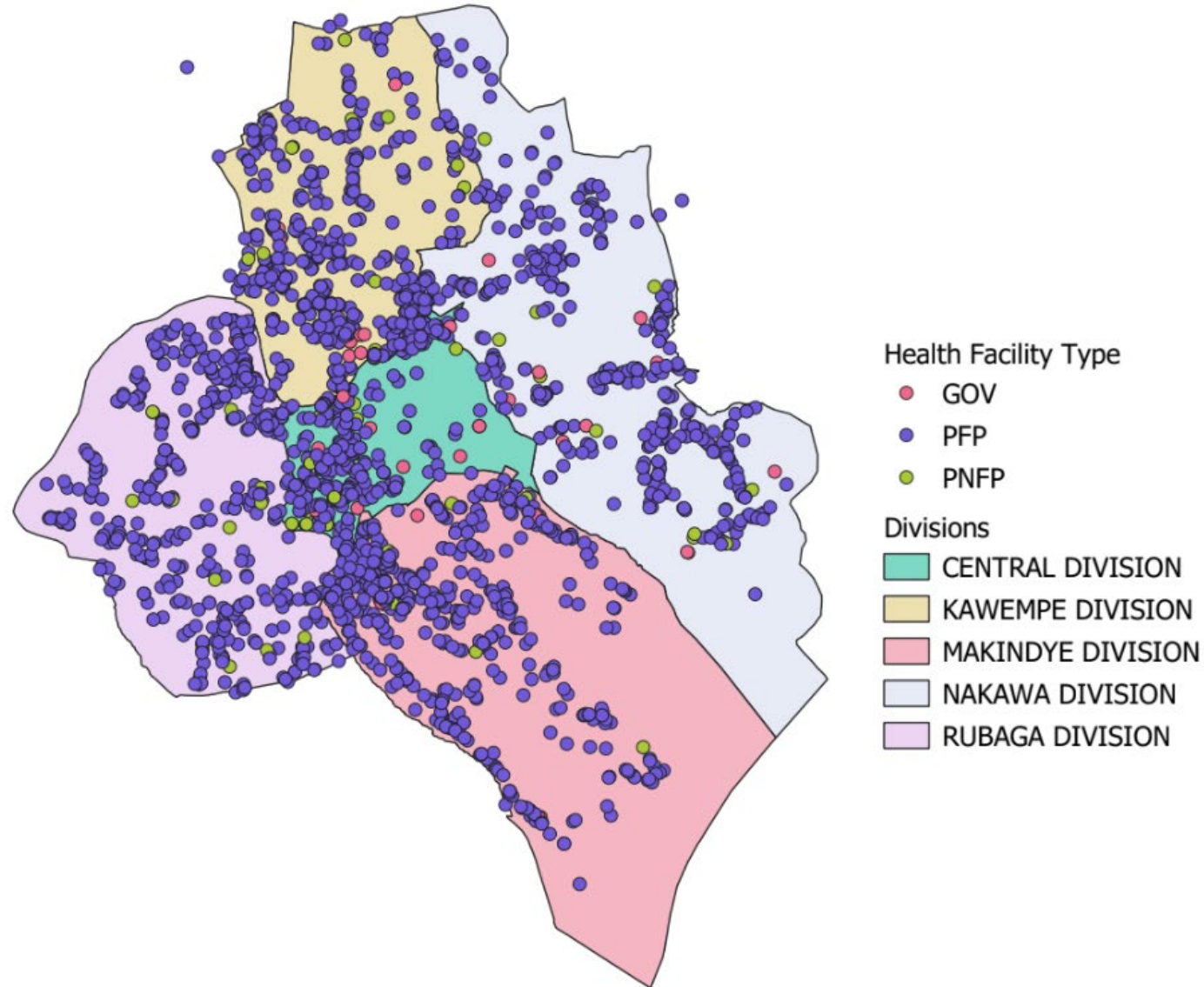
# Malaria service providers in Kampala divisions



- The private sector dominates malaria service provision in Kampala City. Makindye, Nakawa and Rubaga have the most private service providers.
- This may have implications on quality of care and surveillance of malaria

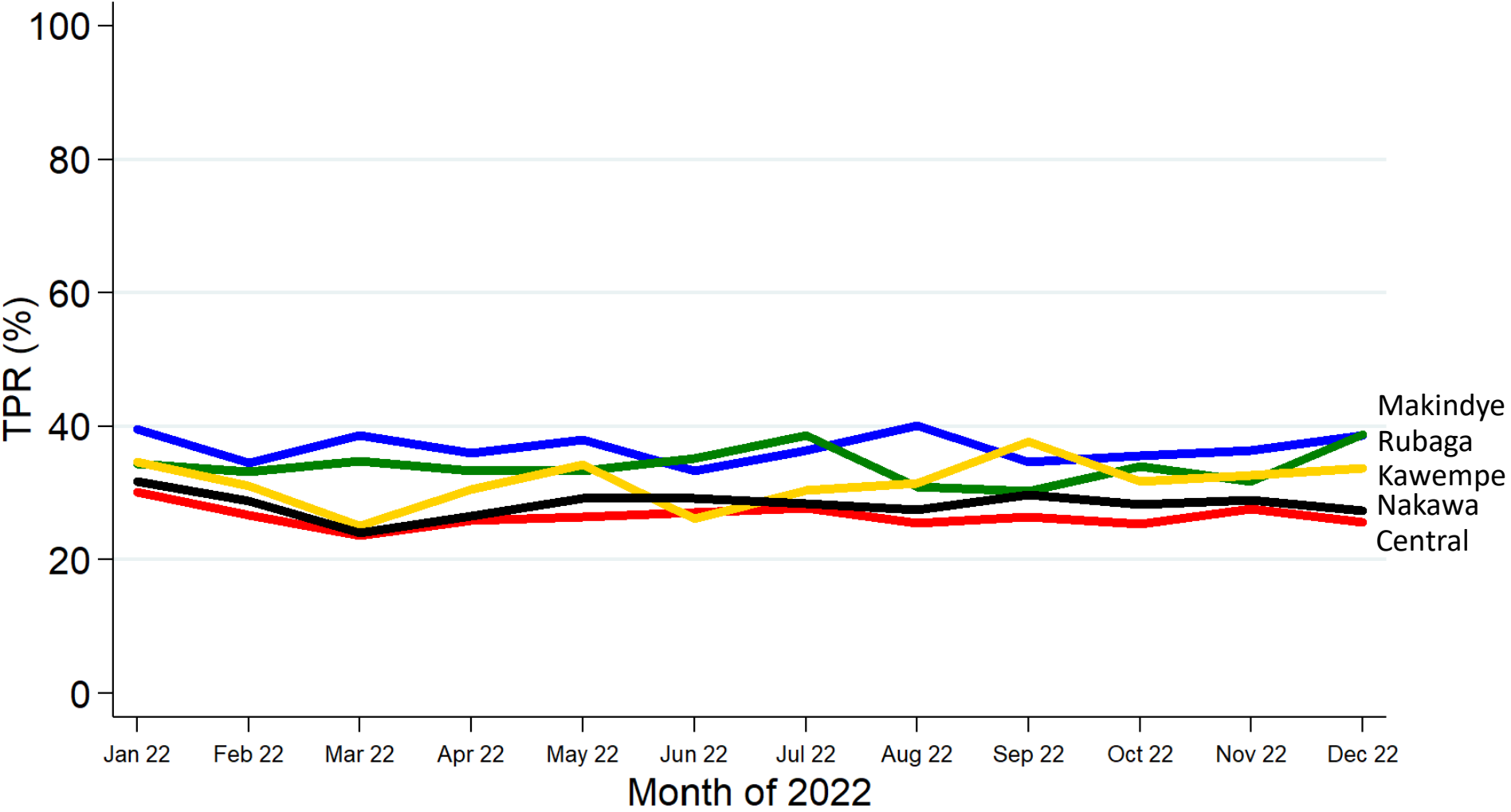


# Malaria service providers in Kampala divisions



- PFP facilities dominate the service delivery landscape
- There is a concentration of facilities towards the south western part of the central division

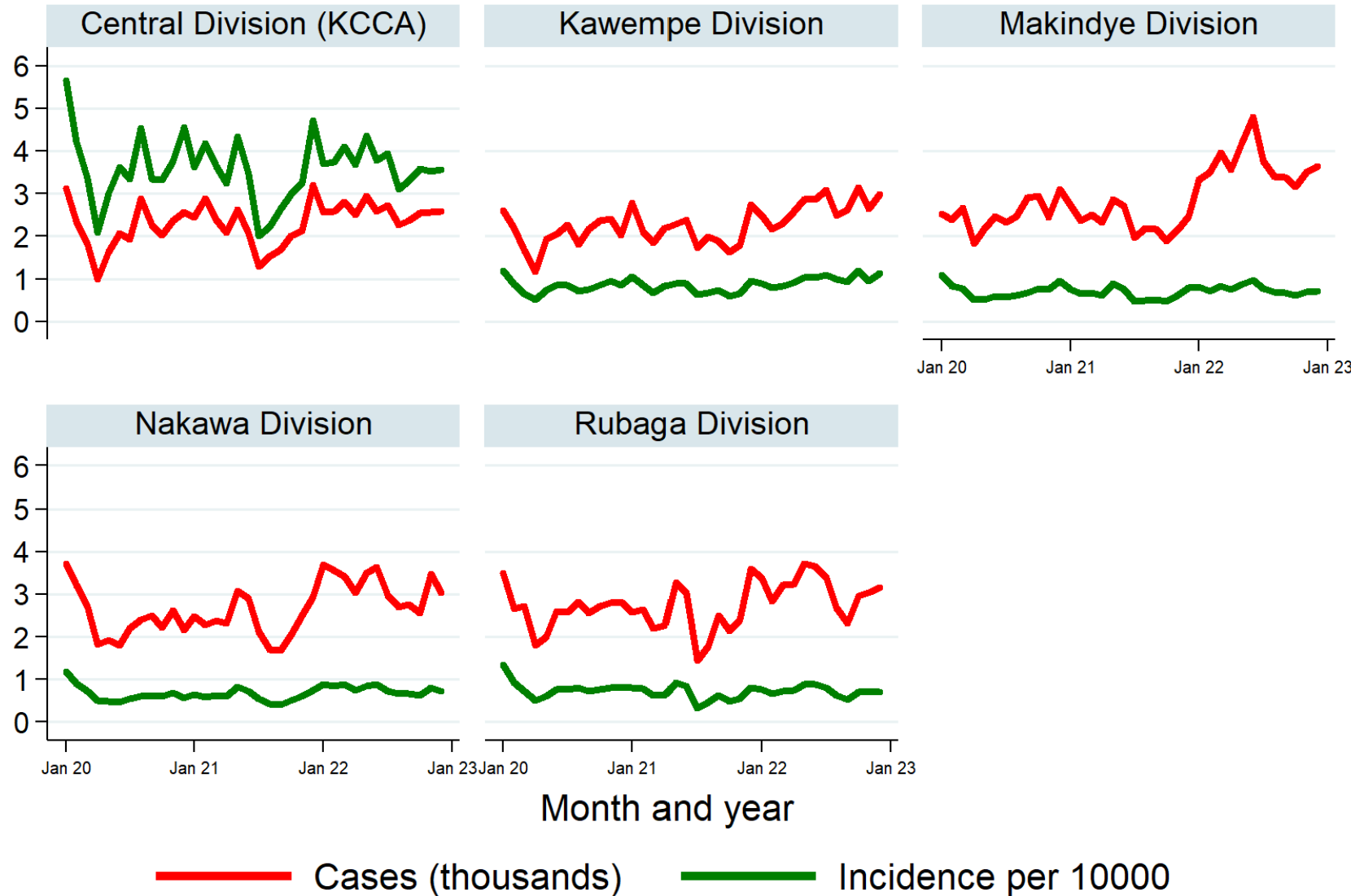
# Trends in Test Positivity Rate for Kampala



Average TPR in 2022 was 25% for Kampala

TPR is highest in Makindye and lowest in Central division

# Trends in Malaria Cases & Incidence for Divisions of Kampala City, Jan 2020 to Dec 2022



The divisions report an average of 2200 to 2800 malaria cases per month.

Makindye, Rubaga and Nakawa report the most monthly cases

Central division has the highest monthly average malaria incidence  $\sim 3$  per 10,000 people. The other divisions report  $<1$  case per 10,000 people per month

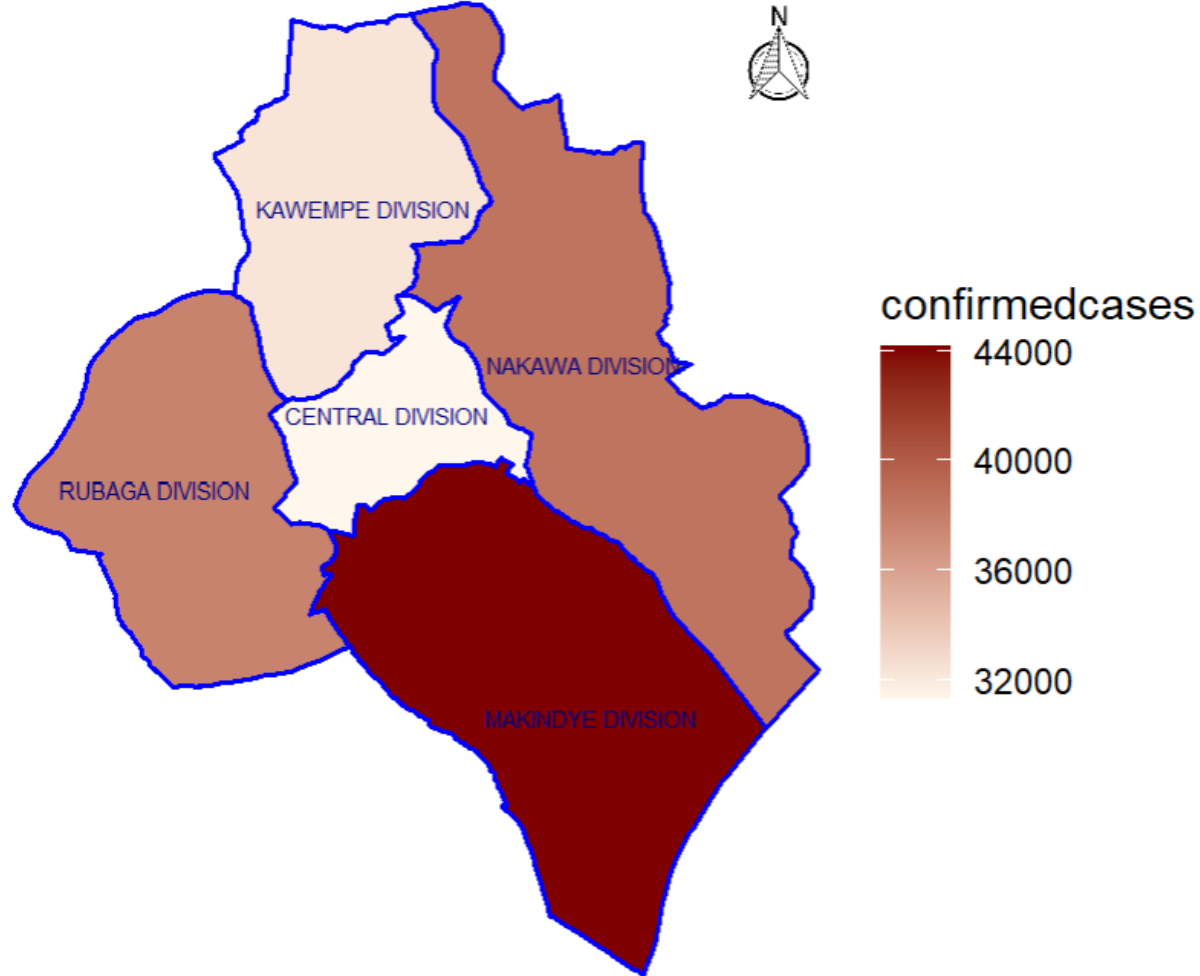
Central has the least population with a high day time population.

# Malaria Incidence (cases/1000) by age group for divisions of Kampala in 2022

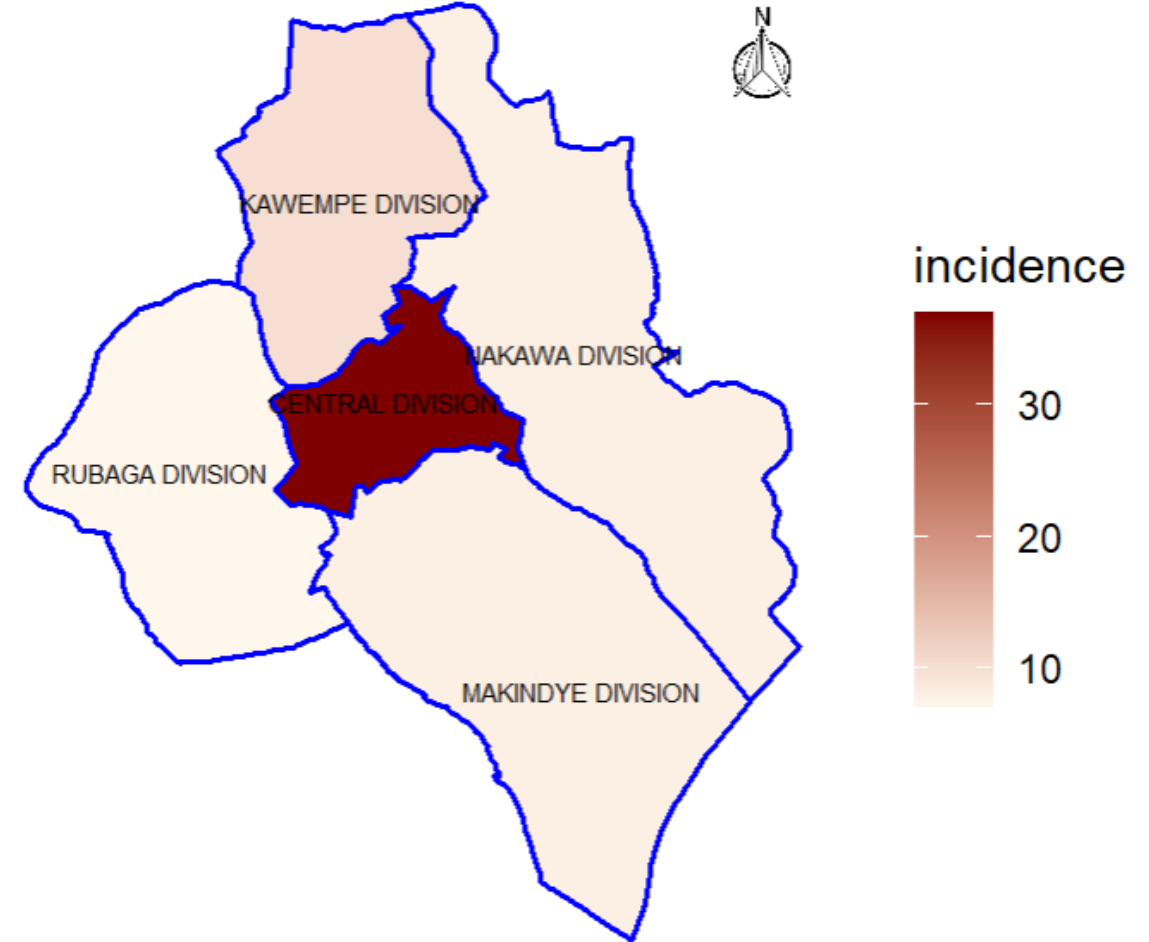
Division	U5s	5-9years	10+ years
Central	255	304	429
Kawempe	92	98	81
Makindye	104	96	97
Nakawa	98	93	114
Rubaga	108	95	79

- Highest Incidence in all age groups is from Central division.
- Most people get care from the central business district (Central division)
- 10+ year the most at risk of malaria in Central division
- Important to know where they come from (residence)

# Spatial distribution of Malaria Cases vs Incidence



Makindye division (dark red) has the most malaria cases reported, while Central division has the least malaria cases reported



Central division has the highest incidence of malaria followed by Kawempe division. Rubaga has the lowest incidence

# Conclusions

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- There is heterogeneity of malaria is seen in Kampala
- Makindye division reports the most cases of malaria in Kampala
- Central division has the highest incidence of malaria
  - The metro area population of Kampala in 2022 was 3,652,000 (double the population of the city)
  - Most working people get care in the central business district
    - “Better facilities in the city”
- Adults >20 years old contribute the most malaria cases
  - Travel risk of malaria
- Private sector players provide the most malaria services in the city

# Recommendations

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- Stratification is key for malaria intervention packaging in cities
- Adults population should be targeted with malaria prevention messaging to curb transmission to younger age groups
- Private sector support for malaria service delivery and surveillance should be emphasized.
- Surveillance to capture residence of cases to aid mapping of interventions

# Acknowledgements

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- The leadership of the Ministry of Health Uganda
- National Malaria Control Division
- Kampala Capital City Authority
- RBM Partnership