Investigating the Prevalence of Parkinson's Disease in the Hai District of Tanzania; A Pilot Study

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Introduction

Demographic transitions in East Africa have lead to a dual burden of communicable (e.g. Malaria and TB) and non-communicable diseases. Parkinson's disease (PD) provides an example of a non-communicable neurological disorder expected to increase in burden in an ageing population(1). However, knowledge and awareness are limited(2). Prevalence studies in sub-Saharan Africa have been minimal with the last conducted in Tanzania in 2006 (3).

A repeat prevalence study is being conducted in Tanzania as part of the Transforming Parkinson's Care in Africa (TraPCAf) study, led from Newcastle University(4).

Aim: To use pilot data to estimate the prevalence of Parkinson's disease in Hai district.

Methods

1. Census

- During April-May 2023, a door-to-door census was conducted of Hai district in the northern Kilimanjaro region of Tanzania.
- **Demographic data** were collected and **five screening questions relating to the symptoms of PD were asked.**
- This was completed by 68 enumerators who attended a training day and run by five Newcastle Masters of Research (MRes) students and Tanzanian and UK supervisors.
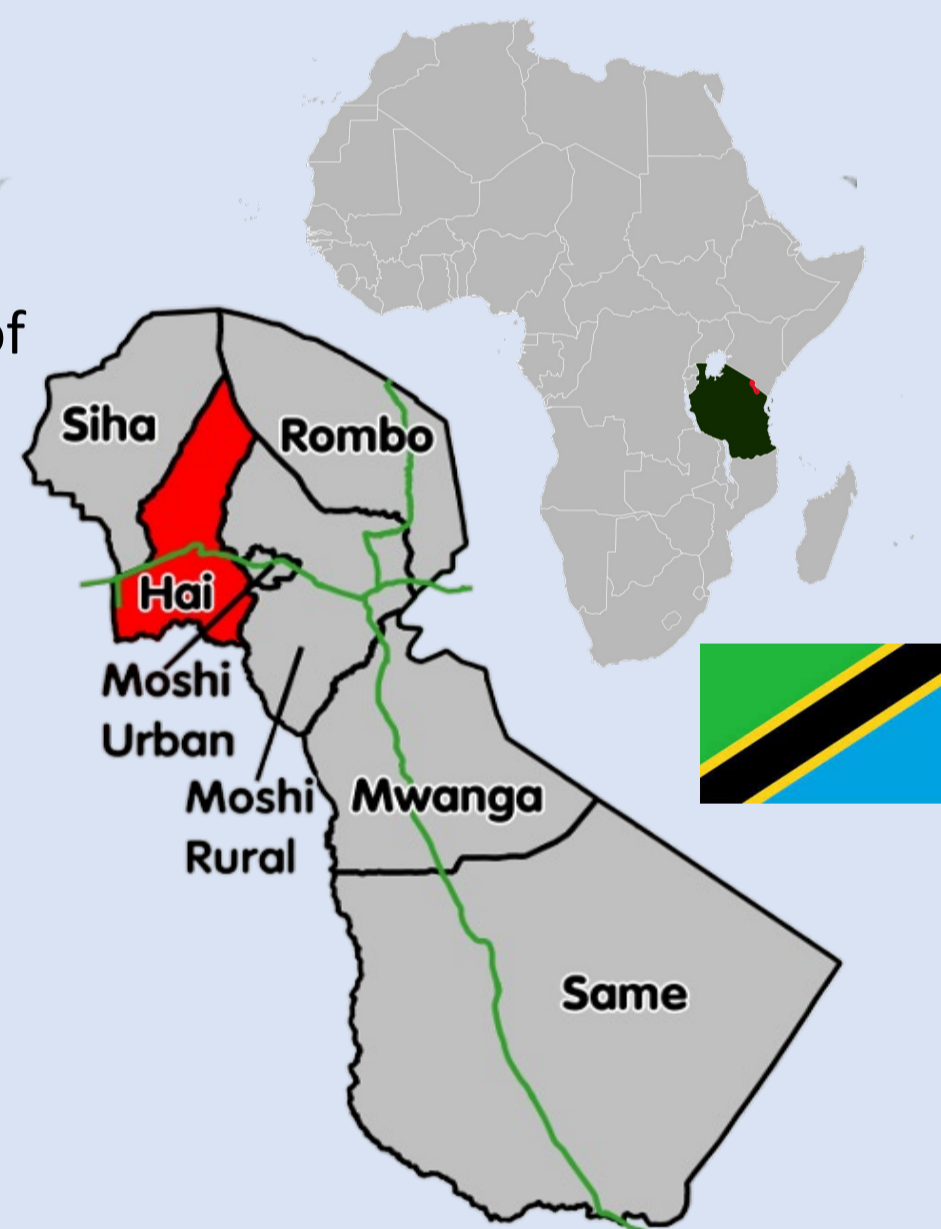

Figure 1. Map identifying Hai district in the Kilimanjaro region of Tanzania

2. Village visits

People who screened positive to the questions were identified and then **invited to participate in the prevalence study.** They were **assessed by a research doctor in the local healthcare clinic or at home.**

Figure 2. Village clinic to assess those that screened positive

Figure 3. Kilimanjaro Christian Medical College

3. Neurology Clinic

- Participants thought to have signs of PD by the research doctor were invited to **Kilimanjaro Christian Medical Centre (KCMC)** for **assessment by a specialist neurologist**.
- The neurologist would determine PD diagnosis and **assess the severity and presentation**.
- The patient was invited to participate in further research. If consented, **further questions** were asked about their **symptoms, quality of life and exposure to risk factors.**

Following the census, I was involved in the project late June to August 2023 assisting in stages 2 and 3.

Demographics

Data were collected from **six villages** situated in both highlands and lowlands of Hai district:

- The majority of the population was Chagga and Christian (80.1%) with an Islamic minority (19.7%).
- 51.4% female. 48.6% male.
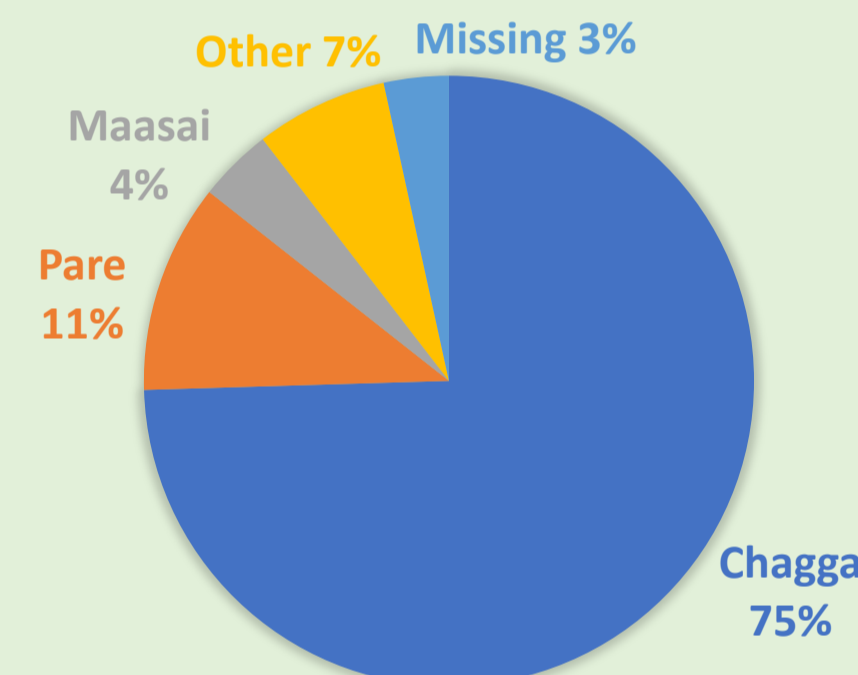- 47.4% agricultural workers. 27.4% students.


Chart 1. Ethnic breakdown of the population screened.

Results

Table 1. Summary of six villages screened and cases of Parkinson's disease identified.

Village	Population screened	Percent %	PD Cases
Cheki Maji	1927	21.5	0
Kimira	1471	16.5	0
Kware	924	10.3	1
Kyeeri	1936	21.6	2
Mulama	907	10.1	2
Usari	1799	20.1	2
Total	**8964**	**100**	**7**

- **261 people (2.9%) screened positive** at the census and were visited in local village clinics or at home. **20 people** were invited to the clinic at KCMC.
- **7 people** with Parkinson's disease were identified, 3 females, 4 males.
- The most common conditions found from non-PD positive screens (false positives) were arthritis (n=18), fractures or injury (n=9) and frailty (n=6).

Discussion

Chart 2. Crude prevalence (in cases per 100,000) for each age group calculated from pilot data.
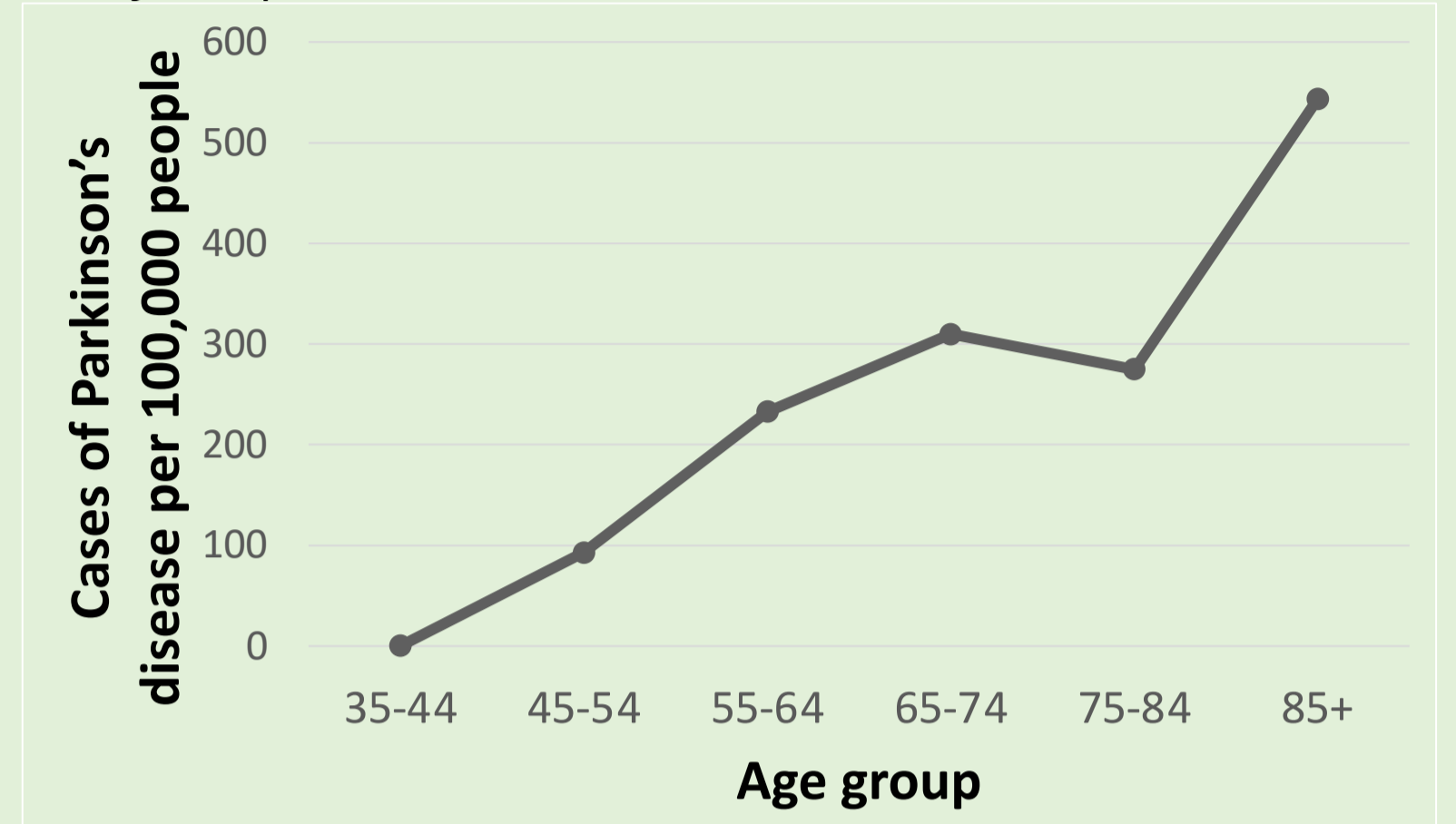
- The crude prevalence from this pilot data is **78.1 per 100,000 people**.
- The **age standardised rate** to the 2021 world population(5) is **63.1 per 100,000 people**.
- Using this to compare between different population sizes, the prevalence in Hai has increased from 24 per 100,000 people in 2006(3) (crude 20/100,000) to 63 per 100,000 people.
- Importantly, with only pilot data available, definite conclusions cannot be drawn.

Conclusions

- The pilot prevalence figures appears to be lower than the global prevalence and figures in Higher Income Countries (HICs), but higher than previously for this area in 2006(6).
- **Challenges remain in diagnosing Parkinson's,** such as misdiagnosis, sparsity of neurologists and accessibility to health services(2).
- Community screening of the total 68 villages in Hai district should be **completed by the end of this year,** allowing total prevalence to be calculated.

Information about the prevalence of Parkinson's will play a significant role in improving knowledge and care of PD in Tanzania and sub-Saharan Africa.
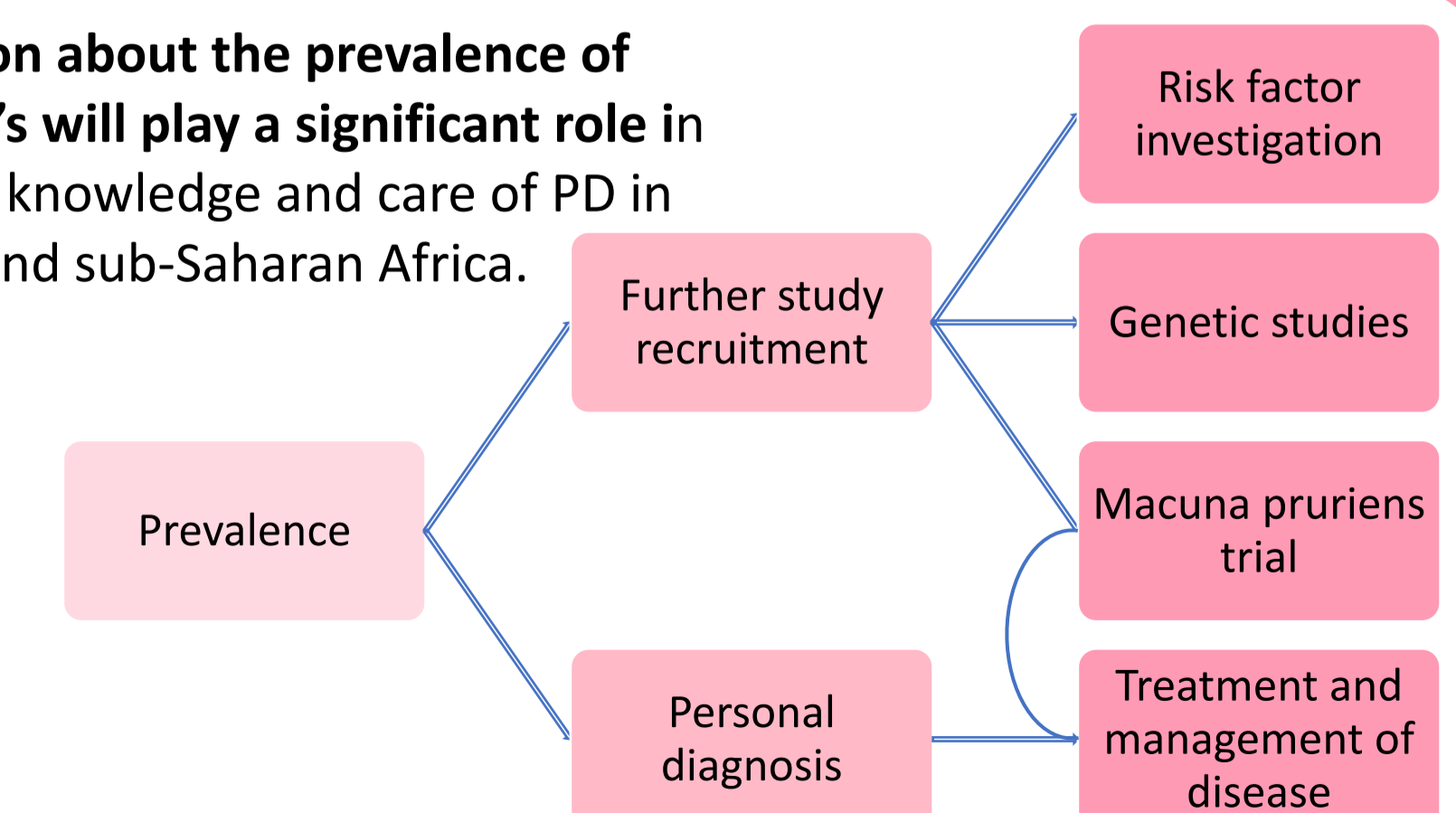

Figure 4. Future actions from this study conducted by the TraPCAf project(4), demonstrating 'Research for Impact'.

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6. Global Burden of Disease Collaborative Network, Global Burden of Disease Study 2019 (GBD 2019) Results. [Internet]. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2020. Available from https://vizhub.healthdata.org/gbd-results/