

RESEARCH

# Human Rabies in Kumasi: A Growing Public Health Concern

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## DECLARATION

The authors declare no competing interests.

## RESULTS

### Basic Demographic Information

A total of twenty-one (21) cases of suspected Human Rabies, were identified during the 25-month period. Diagnosis was made from the history, clinical examination and the fact that the patients died. All cases identified satisfied the case definition of human rabies, except for laboratory confirmation. There were 11 (52.4%) males and 10 (47.6%) females. The ages of the patients ranged from 3 to 55 years with a mean age of 19.8 years. The majority of cases (52.4%) were 18 years or older. January 2015 recorded the most cases (3) in a month compared with a total of 8 and 10 cases recorded for years 2013 and 2014 respectively (Fig 1).

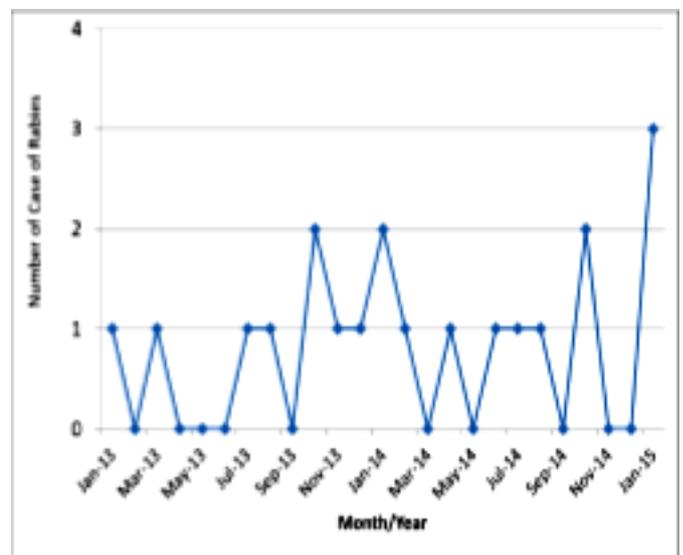
## BACKGROUND

Rabies is a viral illness with an almost 100% case fatality rate caused by the Rabies virus (1)(2). The virus belongs to the class Rhabdoviridae. The disease is transmitted through the bite or scratch from an infected animal usually dogs although wild animals such as foxes are also known to transmit the disease(3)(4). Ninety five percent of the estimated 55,000 Rabies cases occur in Africa and Asia(2)(5). Rabies has been eliminated in most developed countries through multi-pronged strategies including the Oral Rabies Vaccination (ORV) of some wildlife. Ghana still reports cases of rabies (6). Prevention remains the only viable Public Health tool and requires vaccination of persons at risk or passive immunization and vaccination of persons exposed to the virus (7).

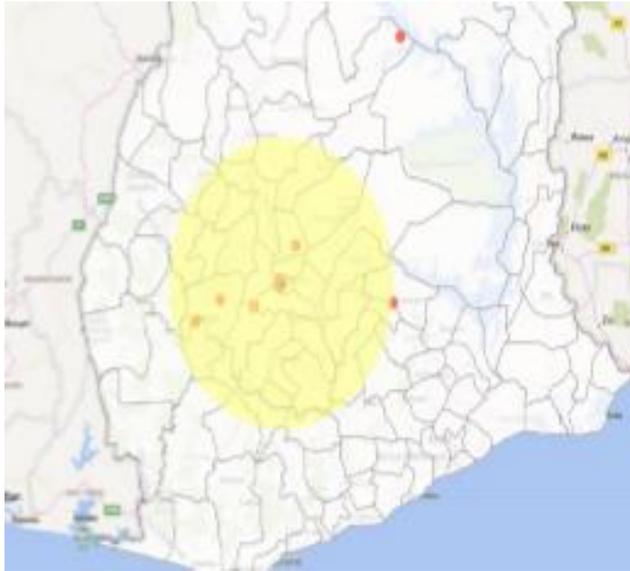
In the 1980s, Ghana embarked on an aggressive campaign to vaccinate dogs against Rabies (3). The campaign was not sustained and has been stopped since 1994. Individual dog owners have to make out-of pocket payments to vaccinate their dogs, and current dog vaccination rates from 2000 to 2013 between 5% to 30 percent (8). These challenges coupled with the sporadic nature of supplies for post exposure prophylaxis (vaccines and immunoglobulins) mean an increased risk of outbreaks of Rabies (4). Data on trends of rabies incidence, as well as canine vaccinations are not adequately available. Rabies surveillance was only instituted as part of the IDSR from 2012 (7). According to data available from the Rabies in West Africa (RIWA, Ghana), a voluntary organization which coordinates veterinary surveillance in Ghana and the sub-region, 9 cases of Rabies were recorded in nationwide in 2009, increasing to 16 and 18 in 2011 and 2012, respectively, with a 100% case fatality in all years. For the same period, passively reported cases of Dog Rabies were 19, 63, 51 and 47 for 2009, 2010, 2011 and 2012, respectively (8). According to RIWA, this is likely underreported due to ineffective surveillance systems. In January 2015 alone, 3 cases had been reported in Komfo Anokye Teaching Hospital (9). We reviewed cases of Rabies seen at the Komfo Anokye Teaching Hospital, Kumasi, Ghana.

## METHODS

All cases of Human Rabies seen at the Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana from January 2013 to January 2015 were reviewed. The review involved case notes of all suspected cases and the case-based forms filled by Disease Control Officers which were submitted to the Disease Surveillance Unit of the Ghana Health Service. Data was analysed using Epi Info version 7.1.4. Microsoft Excel and Epi Info were used to generate charts and map respectively.



A total of 9 cases (42.9%) were resident in the city of Kumasi with the remaining cases distributed over a wide geographic area (Fig 2). Only one community recorded more than a case (Asuofua reported 2 cases). The two cases from Asuofua were not related.



### Receipt of PEP

About a third of cases presented in a health facility following the animal bite but did not receive the recommended PEP. Information on action taken following exposure could not be determined for approximately a third of cases with the remainder not reporting to a health facility following the exposure.

### Clinical History, Presentation and Outcome

All cases except one reported a history of a dog bite. The one exception was a cat bite. More than half (55%) of exposures due to dog bites resulted from stray dogs. The time between exposure and the onset of symptoms ranged between 3 weeks and 4 months with 52.4% of cases reporting the onset of symptoms approximately 2 months after exposure.

The commonest symptoms were hydrophobia and agitation. No post-mortem examination was undertaken on any of the cases reported. No veterinary post mortem was recorded to have been carried out for any of the biting dogs as no information on the animals were recorded.

All cases died (Case Fatality Rate of 100%) with about 60% of cases dying within 24 hours of admission. The longest duration of stay recorded was 5 days (3 cases).

### Discussion and conclusion

The numbers of cases of Rabies seen during the period present a source of concern for Public Health. Even though data on the trends of rabies incidence are not adequately available to conclude that the numbers are increasing, it is unacceptable that such numbers continue to die from such a preventable disease. Of particular concern is the high number of patients who accessed healthcare following the exposure to the virus but who did not receive the recommended PEP (due to unavailability or non-adherence to guidelines for PEP for Rabies). Such deaths could have been averted had the recommended PEP been given as the effectiveness of PEP for Rabies has been demonstrated in several countries, including resource-poor settings (10)(11). Surveillance has a key role to play in ensuring that cases of rabies are promptly detected and the necessary public health actions instituted (4)(12). Currently, the surveillance system captures rabies cases (suspected or confirmed) but a dog-bite surveillance system would probably be more useful. It would help to ensure that individuals who report with dog bites are appropriately managed and followed up and also help public health authorities to better quantify deaths occurring as a result of shortages of the Rabies vaccine and immunoglobulin. Another area of concern is the lack of follow up information on the biting dogs. Since the biting incidence likely occurs days to weeks before the onset of rabies, it is important that preliminary management involves a record of the location and state of vaccination of the biting animal for possible follow up at a

later date. This will require collaboration between veterinarians and physicians to ensure adequate public education on the safe management and disposal of biting animals.

Wild-life related rabies does not seem to be of Public Health importance as all cases were from domestic animals, especially dogs. This is in line with previous studies which found a large stray canine population to be the major source of human rabies in Ghana (4)(13). The wide geographical distribution of cases (Fig 2) however has public health implications.

The literature on Rabies suggests that children are more affected than adults. Contrary to this, our study findings indicates that the majority of suspected rabies cases (52.4%) seen in KATH were 18 years or older. This requires further investigation to determine whether dog bites in children are better managed with appropriate PEP or perhaps, the children are dying at home and their deaths not reported to health authorities.

Rabies is still a disease of Public Health importance in Ghana (7). Aggressive efforts at reducing the incidence of the disease must be pursued. Even though the previous Rabies campaign in Ghana may have been discontinued for any number of reasons, likely some related to cost and sustainability, it is important to consider such issues in light of the possible savings that can be realised through prevention programs, as demonstrated in other developing-country settings (5)(14)(15). The control of a large population of stray dogs and uncooperative domestic pet owners presents a challenge. In the meantime, the Rabies vaccine as well as immunoglobulins for PEP must be made available in all health facilities to ensure eligible patients receive the recommended PEP promptly. The training of Healthcare staff on PEP for Rabies, Mass Vaccination of animals, enforcement of legislation on stray animals and Public Education on the disease is recommended.

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