

**Risk assessment of human behaviors  
that may impact on the health of the  
Mountain Gorillas around Bwindi  
Impenetrable National Park**

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# Introduction

- ❑ Human - gorilla interactions (direct & indirect) continue to increase
- ❑ Current available annual gorilla permits are 26,280 (9 groups)
- ❑ 3-man advance team, 2 tourist guides/trackers, 2 SWIFT officers, 4-5 porters & 8 tourists make 20 persons per group x 9 x 365
- ❑ Potential number of people on gorilla trails is 65,700 per annum.
- ❑ With occupancy rate of 92 % (2007) this translates to 60,444 persons



# Introduction cont'd

- ❑ This high level of interaction is likely to increase risks of cross-transmission of infectious diseases owing to the close genetic relationship
- ❑ The interference with mt. gorillas normal living patterns can lead to stress and related health down-turn



# Introduction cont'd

- ❑ Disease risk is currently highlighted by the conservation community as a serious threat
- ❑ Contributes 24% of mt. gorilla deaths and is 2<sup>nd</sup> to trauma which causes 40%



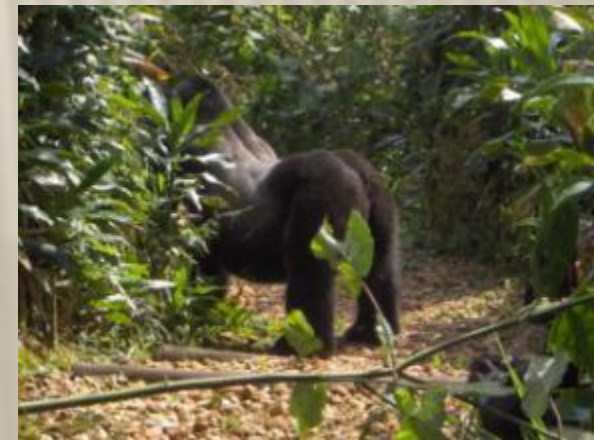
# Statement of the problem

- ❑ Active surveillance is not yet included in the park management strategies and basic information is yet to be compiled which could contribute to guiding principles



# Objectives of the study

- ❑ The study was carried out to provide preliminary information to offer basis from which active surveillance studies may be initiated
- ❑ We assessed potentially risky sanitary human behaviors which may contribute to environmental loading with parasitic and infectious agents



# Methods

- ❑ Study area- BINP-Mukono parish  
(Buhoma, Mukono and Nkwenda villages)
- ❑ Study subjects included
  - i) Tourists (51)
  - ii) Park staff (36/110)
  - iii) Local people using Kisoro-Kanungu trail (40)
  - iv) Local people digging/living at the edge (36)
- ❑ Study instrument
  - i) Specific questionnaire were designed for each group
  - ii) Self administered (English)
  - ii) Interview using Rukiga-translation and recording in English



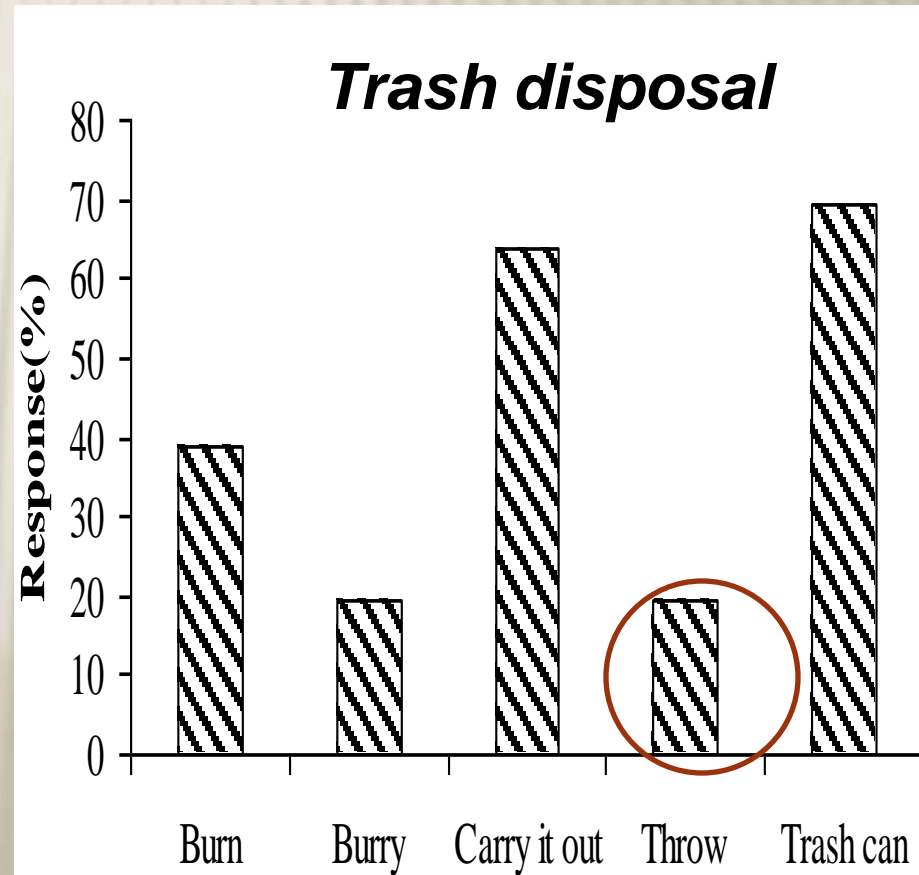
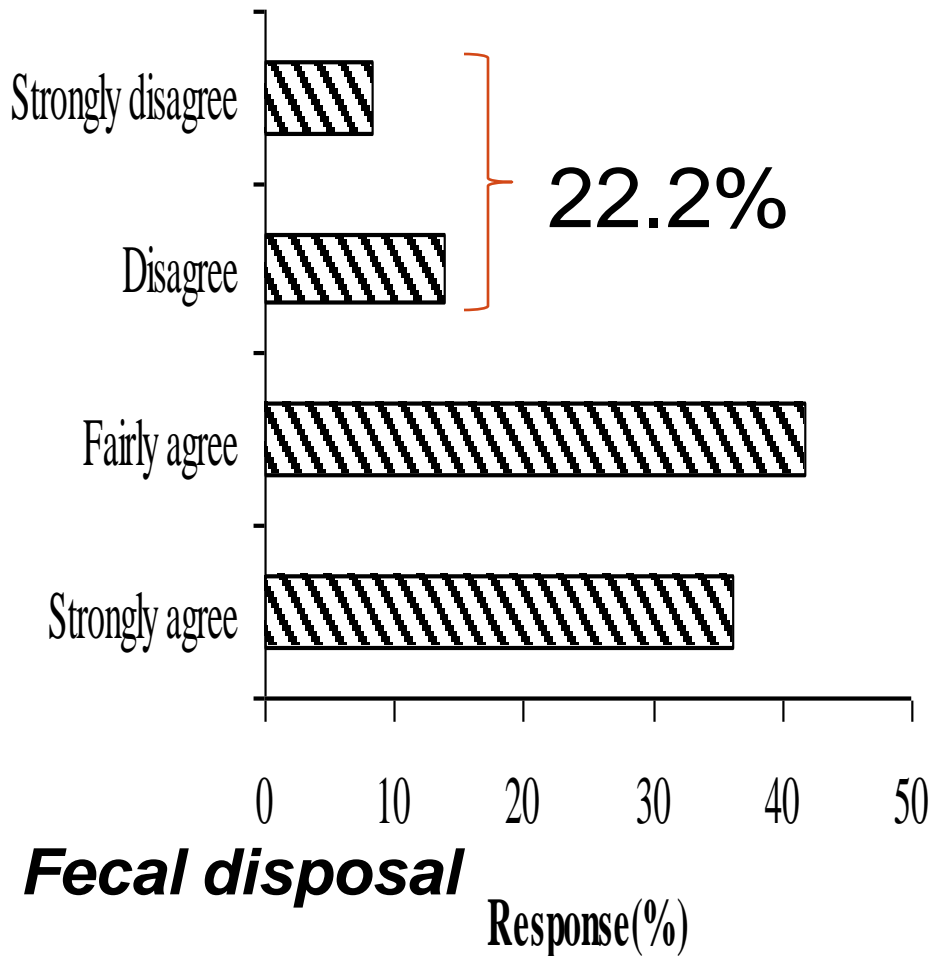
# Results (Staff)

## ***Defecation while in the field (N=35)***

- ❖ 68.6% Dig a 30 cm hole
- ❖ 31.4 % Ease themselves in the bush

## ***Drinking water in field***

- ❖ 86.1% untreated





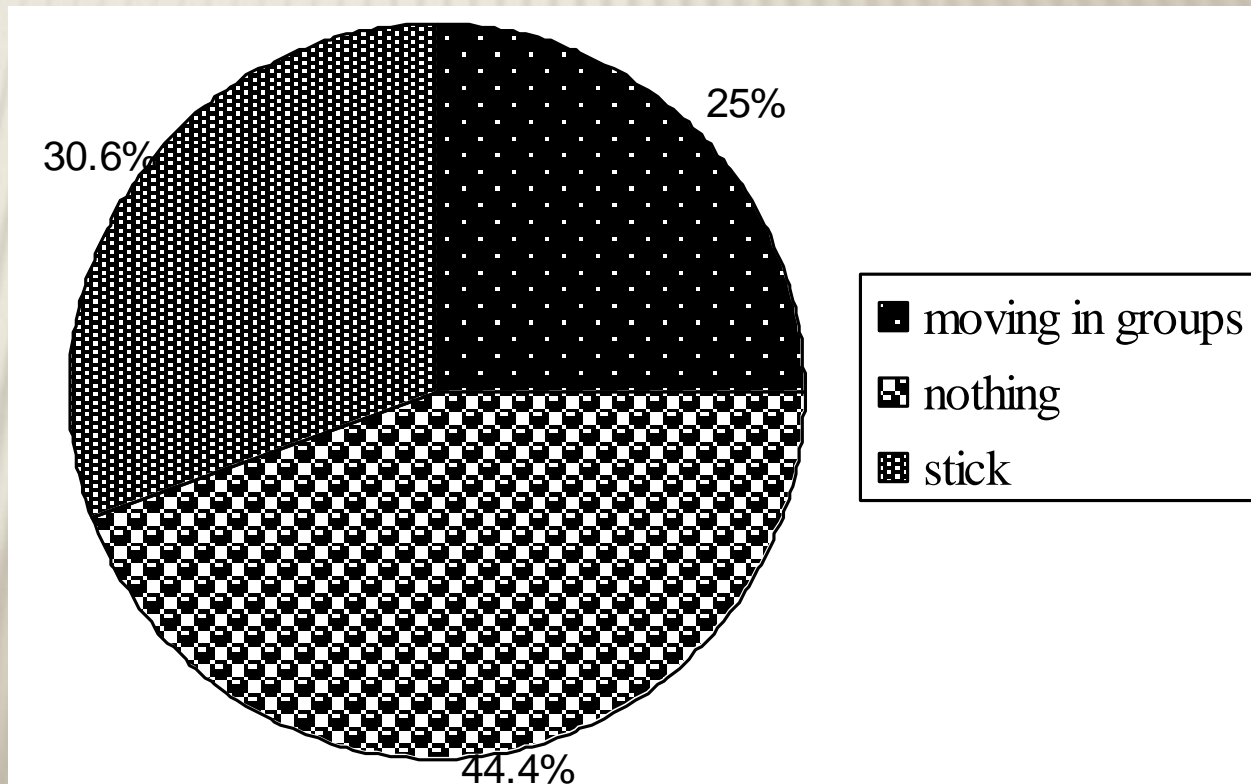
# Results (Local travelers)

District	Kanungu	Kisoro
	70 %	30 %
Gender	Male	Female
	72.5%	27.5 %

## *Demography*

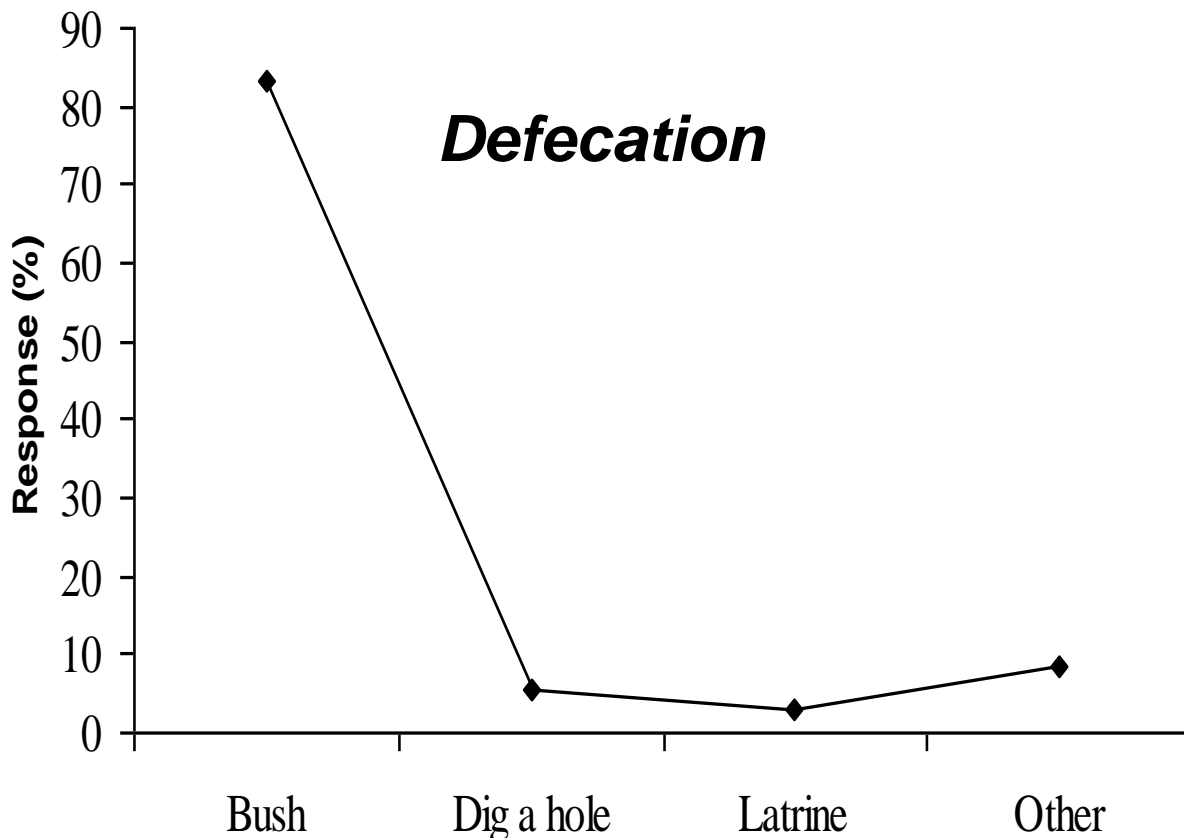
❖ 82.5%  
meet gorillas

❖ **Security  
precaution  
Inside the forest**



# Results Travelers Cont'd

- ❖ 62.5 % eat from forest & 44.% leave food remains there
- ❖ Sneezing : 97.2 % use hankie, 40 % use hands, 22 % use leaves
- ❖ 80 % drink directly from park streams



# Results (Local people peripheral to the park)

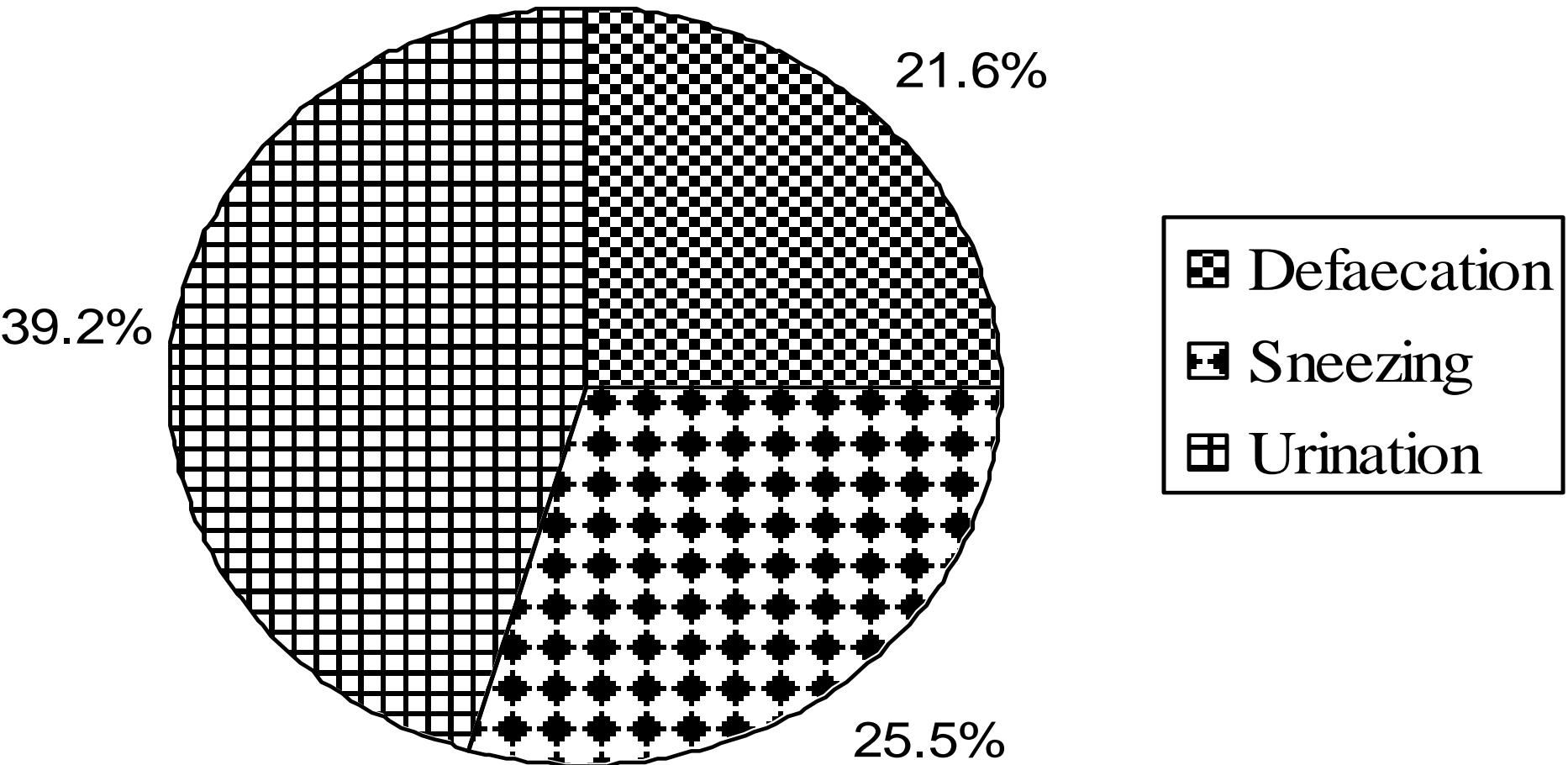
- ❖ Gender : 72.8 % M, 27.2 % F
- ❖ Mean Age : 40 Yrs
- ❖ 94.4 % see gorillas in the community at  $3.4 \pm 2.5$  times /month
- ❖ 77.2 % dug around the park
- ❖ 41.7 % tie domestics near the park
- ❖ 78.1 % defecate in their gardens while working
- ❖ 50% defecate in the bushes
- ❖ 22.9 % take children in the garden & ease themselves in the bushes
- ❖ 72.9 eat from gardens & 95.8 % leave food remains in the gardens

# Results (Tourists)

- ❖ Mean age:  $45.8 \pm 15.6$  years
- ❖ 98 % were 1<sup>st</sup> time visitors
- ❖ 13.8 days away from home on average
- ❖ 13.3% ate from the forest and 86.7 % did not
- ❖ 71.4% carried food remains & trash out in their bags
- ❖ 25.6%(N=43) admitted seeing actions which could lead to possible exchange of disease with animals

# Results (Tourists cont'd)

## *Excrement action*



# Discussion

- ❖ Field personnel confessing not to bury feces have doubled compared to nine years ago (31.4 % Vs 16 %)
- ❖ Observation indicates that staff are not waited for Vs when a tourist has to carry out the same

**Is the 30 cm (1 ft) a problem ?**

- ❖ May be because no frequent disease outbreaks



# Discussion cont'd

- ❖ High % continues to drink untreated water since 9 years ago  
88.9 % Vs 79%
- ❖ Staff interact with locals and gorillas daily. Vaccinated Vs only childhood diseases, thus are potentially high “pathogen traffickers”
- ❖ The 1<sup>st</sup> respiratory outbreak in December 2007 could claim “the Friend a Gorilla champion” Makara & others if it was not for treatment with Enrofloxacin
- ❖ Laxity among regulation enforcement personnel on fecal disposal could cost us a lot



# Discussion cont'd (local people)

- ❖ No major confrontations between local travelers & gorillas
- ❖ They likely cause environmental loading with pathogens along the trail, and leave waste exposed since they don't carry tools
- ❖ Communal urination points on the trail can attract animals for mineral licks & could offer a point –source of disease
- ❖ Similarly there is danger from those who have activities around the park where both adults and children defecate in the bushes



# Discussion cont'd (Tourists)

- ❖ The low rate of defecation may be attributed to use of the toilet regulation before entering the forest
- ❖ Also may be due to Brain-Gut Axis (BGA) activity deployment leading to reduced ingesta transit time
- ❖ Use of factory tissue Vs natural tissue is not environmentally friendly but no regulation exists yet of carrying used tissue
- ❖ Tracking exhaustion lead tourists to eat without taking much care about the sanitation, and can be a contributor to travel diarrhea in the next destination

# Conclusion

❑ The registered human sanitary behaviours fall-short of the expectations & are potential source of environmental contamination in Bwindi



# Recommendations

- Top management need to be vigilant in making sure field personnel comply to regulations
- Laxity in sanitary behaviors among park staff justifies vigorously instituting ‘Employee Health Care” model in Uganda
- Establish public pit latrines on both ends of the Kisoro-Kanungu trail & encourage travelers to disperse urine along the trail
- Intensify public health education/ sensitization during community conservation out-reach
- Consider including active disease surveillance in the management strategies of Bwindi

# MOUNTAIN GORILLA VETERINARY PROJECT



# Any Questions & answers?

