



Best Practice Guidelines for Health Monitoring and Disease Control in Great Ape Populations

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Appendix I. An Example of Quarantine & Hygiene Procedures (Wittig & Leendertz 2014 Tai Chimpanzee Project)

Quarantine Camp

For everyone: compulsory 5-day* quarantine before going to the chimpanzee research camps.

The quarantine period starts on Friday afternoon, when assistants come back to the park after their week off, and ends five days later on Wednesday afternoon. In normal routines, no one should join the quarantine later than Friday, as it will interrupt the quarantine cycle, in which case quarantine needs to start all over again. Travellers arriving on days other than Friday (international travellers or coming from Abidjan) can start their quarantine in north camp so as not to interrupt the routine quarantine.

Quarantine rules

- People showing any symptoms of illness on Friday are not allowed to enter the quarantine or any of the other camps, but must stay in the village until recovery, and then join the next quarantine period.
- People in quarantine have to wear **masks** when in proximity of non-quarantined people. Masks must be renewed at least once every day.
- They are allowed to do forest work except for chimpanzee and mangabey monitoring (maintenance of the trails, botany, etc.). They are not allowed to work together with people that have passed the quarantine.
- When not working, they must be in the quarantine camp and minimise contact with people from the research camps.
- Equipment attributed to the quarantine camp (kitchenware, buckets, cleaning equipment) is restricted to this camp and must not be used in the research camps.

Monitoring of respiratory virus infections

Throat swabs from every person in quarantine will be tested for two respiratory viruses (RSV and HMPV) on Day 1 (Saturday) and on Day 5 (Wednesday) of their quarantine. If all results are negative and there are no symptoms, people can move to the research camps.

What to do if someone tests positive during quarantine?

A positive result means that the first PCR screening AND the confirmation PCR are positive for RSV or HMPV.

Positive result on Day 1:

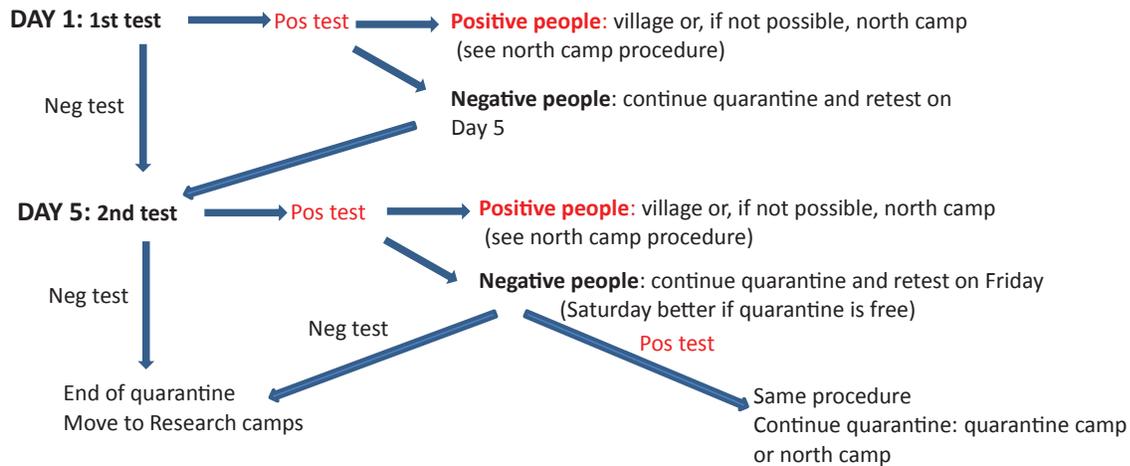
- The positive individual goes back to the village or, if not possible, can be isolated in north camp, which is then in quarantine (see north camp procedure).
- Other members from the quarantine camp are tested on Day 5 and if negative they can move to the research camps. If positive, see below.

Positive result on Day 5:

- The positive individual goes back to the village or, if not possible, can be isolated in north camp, which is then in quarantine (see north camp procedure).
- Negative individuals: quarantine is prolonged until Friday (Day 7) (ideally until Saturday if quarantine camp is free). Tests will be performed again on that day and if negative, staff can move to the research camps. If positive, apply same procedure and extend quarantine for 3 more days. If not possible because quarantine camp is not free, improvise with north camp.

* N.B. The best practice recommendation in these guidelines is that quarantine should be a minimum of 7 days

Throat swab testing during quarantine



What to do if someone falls ill during quarantine?

- Isolate ill individual: any individual showing symptoms of high-risk infectious disease (definition below) must go back to the village until recovery and until he/she can join the next quarantine period (and be isolated in camp until he/she can be driven out, wearing a mask, staying in his/her room). A throat swab will be collected prior to departure and if symptoms suggest a respiratory disease (runny nose, sneezing, coughing or fever), test everyone from quarantine camp for respiratory viruses (RSV, HMPV, coronavirus, influenza, parainfluenza). If return to the village is not possible (students, volunteers, visitors), the ill individual can be isolated in north camp (see north camp procedures).
- The others continue the quarantine for 5 days after the departure of the ill individual OR until Friday if the quarantine camp is not free (arrival of a new team). On the last day, they will be tested for the virus found in the ill person (or all respiratory viruses if no specific one was found). If no symptoms are present AND tests are negative, quarantine ends and they can go to the research camps. If positive or symptoms, apply same procedure and retest after 3 days. If quarantine camp is not free, improvise with north camp.

Quarantine in North Camp

North camp can either:

- Follow the same rhythm as the quarantine camp, in which case north camp and quarantine camp are considered as one same camp and follow the same rules (which implies they'll be quarantined every week from Friday to Wednesday); or
- Be separate from the quarantine camp, which means:
 - Minimise contact with people from quarantine camp and wear masks if in proximity
 - Separate kitchen, kitchenware, bathroom and food from quarantine camp

In scenario b) the north camp will then generally not be in quarantine but can be used:

- As a 5-day quarantine for travellers arriving on days other than Friday (international travellers or from Abidjan). In this case, everybody in north camp is quarantined together with the newly arrived person for the next 5 days. Follow the same rules and procedure as for the normal quarantine in the quarantine camp, except that people tested positive will usually have to stay in camp (visitors, students, volunteers) (see below). **One EXCEPTION:** if the camp manager needs to visit one of the research camps (walk to south camp/east camp/barrage to install something or talk with someone) and the new arrival interrupts his quarantine, he can semi-isolate himself from the others until he finishes his quarantine and can move to the research camps. Semi-isolation can be done by wearing a mask and following

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basic hygiene rules, bearing in mind that transmission of respiratory pathogens can occur by contamination of food and kitchenware (do not touch, do not eat together, do not socialise)!

- ii) To host people who cannot go back to the village (students, volunteers, visitors) when they are ill (coming from the research camps or quarantine) or who tested positive during quarantine.

What to do if someone tests positive during quarantine in north camp?

- The positive person must wear a mask and follow basic hygiene rules (i.e. should not cook for the others, use separate kitchenware, stay mostly in room) to minimise risk of contamination of others and subsequent extension of quarantine.
- **Positive on Day 1:** Everybody continues quarantine and is retested on Day 5. If negative they can move to the research camps. If positive, see below.
- **Positive on Day 5:** Quarantine prolonged until Saturday. Tests will be performed again on that day and if negative, staff can move to the research camps. If positive, apply same procedure and extend quarantine again for 3 days.

What to do if someone falls ill during quarantine in north camp?

- The ill person must wear a mask and follow basic hygiene rules (i.e. should not cook for the others, use separate kitchenware, stay mostly in room) to minimise risk of contamination of others and subsequent extension of quarantine.
- If symptoms suggest a respiratory disease (runny nose, sneezing, coughing or fever), test everybody for respiratory viruses (RSV, HMPV, coronavirus, influenza, parainfluenza).
- Everybody continues quarantine and is tested again three days after the symptoms have disappeared. If negative the quarantine ends. If positive: continue quarantine and retest after 3 days.

What to do if someone positive from quarantine camp is sent to north camp?

- Everybody in north camp is quarantined.
- The positive person must wear a mask and follow basic hygiene rules (i.e. should not cook for the others, use separate kitchenware, stay mostly in room) to minimise risk of contamination of others and subsequent extension of quarantine.
- Everybody continues quarantine and is tested on Day 5. If negative the quarantine ends. If positive, extend quarantine and test 3 days later again.

What to do if someone ill from research camps or quarantine camp is sent to north camp?

- Everybody in north camp is quarantined.
- The ill person must wear a mask and follow basic hygiene rules (i.e. should not cook for the others, use separate kitchenware, stay mostly in room) to minimise risk of contamination of others and subsequent extension of quarantine.
- If symptoms suggest a respiratory disease (runny nose, sneezing, coughing or fever), the ill person as well as everybody from the research camp are tested for respiratory viruses (RSV, HMPV, coronavirus, influenza, parainfluenza).
- Everybody from north camp is tested three days after the symptoms have disappeared. If negative the quarantine ends. If positive: continue quarantine and retest after 3 days.

What to do if someone from north camp falls ill?

- Everybody in north camp is quarantined.
- The ill person must wear a mask and follow basic hygiene rules (i.e. should not cook for the others, use separate kitchenware, stay mostly in room) to minimise risk of contamination of others and subsequent extension of quarantine.
- If symptoms suggest a respiratory disease (runny nose, sneezing, coughing or fever), everybody from north camp is tested for respiratory viruses (RSV, HMPV, coronavirus, influenza, parainfluenza).
- Everybody from north camp is tested three days after the symptoms have disappeared, and if negative the quarantine ends. If positive: continue quarantine and retest after 3 days.

Research Camps

What to do if someone falls ill in a research camp?

- Any individual showing symptoms of high-risk infectious disease (definition below) must go back to the village (and be isolated in camp until he/she can get out: wear a mask, stay in room). A throat swab will be collected prior to departure and if symptoms suggest a respiratory disease (runny nose, sneezing, coughing or fever), everyone from the research camp is tested for respiratory viruses (RSV, HMPV, coronavirus, influenza, parainfluenza). In case return to the village is not possible (students, volunteers, visitors), the ill individual can be isolated in north camp (see north camp procedures).
- Other people from the research camp must STOP working with the chimpanzees for 3 days. Other forest work can continue (cutting trails, botanic...but it is always necessary to carry a mask in case one comes across chimpanzees!). They are retested on the third day and if negative, chimpanzee work can resume. If positive, same procedure and retest everybody again 3 days later.

Symptoms of illness

As a general guideline (but any symptoms should be communicated to the vet asap, who can then decide in which category they belong):

High risk symptoms: runny nose, coughing, sneezing, fever (fever without other symptoms or fever with diarrhoea, vomiting, generalised skin rash...)

- Isolate ill person and send to the village or north camp a.s.a.p.
- In some instances people with high-risk symptoms might not be able to walk out straight away (i.e. high fever). If this is the case they need to isolate themselves in their room, wear a mask, and the camp is then in quarantine until 3 days after the ill person has left and until tests are negative.

Low risk symptoms: headache, fatigue, non-severe diarrhoea (no fever, no blood)

- Sometimes might just be due to tiredness, dehydration, bad food...
- Ill person must wear a mask and stay in room
- Re-evaluate the next day, if worse, send out.

Movement by the Camp Manager

The camp manager is supposed to organise and represent TCP inside and outside the forest. This implies movement between camps and also outside the forest. In order to complete his/her objectives, the camp manager will have the freedom of several exceptions from the quarantine rules. This, however, means the camp manager needs to be especially careful to monitor his/her own health. Also, the camp manager needs to plan trips and visits to the research camps as much as possible in advance in order to minimise the number of exceptions that need to be given.

- Generally: the camp manager has to pass through the quarantine before he/she can move to the research camps.
- If the quarantine of the camp manager is interrupted by a new arrival in the north camp and the manager needs to visit one of the research camps (walk to south camp/east camp/barrage to install something or discuss with someone), he/she can semi-isolate himself from the others until he/she finishes his/her quarantine and can move to the research camps. Semi-isolation can be done by wearing a mask and following basic hygiene rules, bearing in mind that transmission of respiratory pathogens can occur by contamination of food and kitchenware (do not touch, do not eat together, do not socialise)!
- If, during the quarantine, the camp manager has to attend important matter in one of the research camps, the camp manager can move to the specific research camp to solve the problem while wearing a mask and keeping to the hygiene rules (washing/disinfecting hands, etc.). During these visits it is important not to touch, not to eat together and not to socialise with the staff in the research camp.
- If there is an important need for a meeting, that involves staff from inside and outside the quarantine, then people can be brought together but all wearing masks and keeping considerable distance (7 m) between the 'in' and 'out' groups. Here, as well, the rule is: do not touch, do not eat together, do not socialise!

Vaccinations

Several vaccinations and tests/treatments are necessary for anyone to be allowed to observe chimpanzees and mangabeys at TCP:

- measles
- poliomyelitis
- yellow fever
- a tuberculosis antibody test that proves negative
- an annual worm treatment

General Hygiene Rules for Business as Usual

1) **It is strictly forbidden to go into the forest when sick** (cold, cough or any other symptom...). There is no exception to this rule.

2) **Quarantine is mandatory for all** to ensure infectious diseases are not transmitted to chimpanzees or co-workers. Quarantine applies to apparently healthy people as they could be healthy carriers of a number of agents.

3) **Research assistants and students who are sick** should stay in **isolation in the quarantine camp** until they are cleared and **constantly wear a mask**. If assistants exhibit respiratory symptoms, they can only head back to their village after the director agrees. Do not go to the village without the formal agreement of the director. If you intend to get a treatment from the medical doctor in Tai, please discuss this with the director. Sick assistants and students should have their throat and nose swabbed by the veterinarian of the project.

4) Co-workers who have been following the same chimpanzees as a person who has become sick should stop working for 3 days. These people, as well as all others staying at the same camp, should be tested (swabbed) on the day of the onset of the symptoms and 2 days later. Co-workers can resume work on the 4th day after the onset of the symptoms if they are not sick and the tests reveal they are not infected with a respiratory virus. Other people staying at the same camp but following different chimpanzees do not need to stop working.

5) Always wear **a facemask covering your nose and mouth when you see chimpanzees**. Respiratory droplets routinely reach out to 3 metres and sneezing can propagate them over 10 metres. Keep in mind you can infect chimpanzees without even noticing it. If you have to sneeze, turn away from the chimpanzees and sneeze in your hand so everything is blocked. Change your mask every day after lunch, so this measure effectively has a protective effect. You should always have a **back-up mask** in case you would sneeze strongly. In such cases, change your mask immediately and wash your hands. Back at your camp, dispose of all masks used in the forest in the trash bin located in the hygiene zone at the entrance of the camp.

6) **Always maintain a 7-metre distance** when following a chimpanzee. Your target chimpanzee should never watch you; if it does, you are too close. If your target leaves, always carefully move around the other chimpanzees, **without ever pushing or disturbing** them in anyway. If chimpanzees come to be less than 7 metres from you, you should discretely walk away to restore a 7-metre distance.

7) **Never turn your flashlight on under a chimpanzee nest**. If you go under nests in the morning, turn your light off 50 metres before reaching the nests.

8) **There should never be more observers than adult chimpanzees**. If this happens, priority is given to students. In the case where an assistant and a student follow the same target all day long and the target is alone, the assistant should stay 10 metres behind the student, i.e. at a 17-metre distance from the target.

9) **Never leave any food in the forest**. Everything should be brought back to camps and disposed of in trash bins.

10) **Never defaecate in the forest**. Faecal worms can be dangerous for chimpanzees. In case you are unable to avoid defaecating in the forest (e.g. diarrhoea), you should have with you two plastic bags and two rubber gloves to collect your faeces and bring them back to camp to throw into the toilet.

11) **If you have to urinate in the forest**, remove leaves from the ground beforehand, pee and cover it all up with leaves afterwards. Do not urinate in view of the chimpanzees and never where fruits could be collected by chimpanzees.

12) Never spit in the forest. Saliva contains a lot of bacteria that can be very dangerous for chimpanzees.

13) **Always clean your boots with bleach** when entering or going out of the camp; when entering the camp take them off and put them under the shed at the entrance of the camp. This should be respected by everyone. Use

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flip-flops in the camps. You should wash them, as well as any other kind of shoes you may have and use, before leaving for the forest. The bleach in the buckets should be changed every second week. In case of infectious disease outbreak in the forest, it should be changed every second day.

14) **Wash your hands** after you put your boots on as well as **immediately before going in the forest and after coming from the forest**. Water buckets should be prepared and available near the boot washing spot. Also wash your hands before and after eating in the forest, out of sight of the chimpanzees; bring a bit of liquid soap in a tube for that.

15) **Field clothes** should be hung on a wire in the shed at the entrance of the camp (hygiene zone) and should never be used in the camp. If they are to be used in the camp, they should be washed. Field clothes worn for more than 3 days should be washed. You cannot use the same field clothes when observing chimpanzees from different groups, unless the clothes are washed beforehand. Field clothes washed at the camp should be tidied up to avoid contamination.

16) **Field boots and clothes must never leave the camps/forest**. A fine will be charged to those not respecting that rule and they will have to cover 50% of the cost of new boots.

17) **Camps and their surroundings should be clean**. The camp manager will check this out and enforce it. It is everybody's business to keep the camps clean, for example, by properly using rubbish bins, toilets, and so on. More specifically, the camp crew will control trash bins and toilets.



A hygiene station at the entrance to a research camp in Tai NP, Ivory Coast. Project staff and researchers wash their hands, disinfect their boots and change clothes before going into the forest and again upon return © Sonja Metzger/TCP