

## 7 Summary

### **Respiratory diseases in wild chimpanzees of the Taï National Park, Côte d'Ivoire**

It has become clear in the last decades that diseases are a major threat to wild primates. Although several surveys report the occurrence of respiratory diseases in wild chimpanzees, detailed knowledge about aetiology and epidemiology of these diseases is missing. From 1999 to 2006 six severe epidemics of acute respiratory diseases have been observed in wild living chimpanzees of the Taï National Park, Côte d'Ivoire, killing at least 21 individuals. This study presents systematic data on clinic, pathology, pathogens and epidemiology. During a one-year field study (March 2005 to March 2006) data was recorded on occurring diseases, faeces and urine samples were collected and necropsies on chimpanzees that died of disease were performed. All available tissue samples obtained during necropsies were examined histologically. Human throat swabs were examined by PCR and cell culture methods in order to clarify a possible transmission of pathogens from humans to chimpanzees. In addition, molecular diagnostics were performed on chimpanzee lung tissue samples at the Robert Koch-Institute, Berlin.

Clinical symptoms of respiratory disease ranged from mild cough and nasal discharge to severe dyspnoea with weakness, apathy and anorexia. The morbidity of the observed disease outbreaks was high (64% to 100%); the mortality was up to 19%. Pathological and histopathological evaluation conducted in seven cases revealed a severe acute bronchopneumonia as the cause of death. The bacterium *Streptococcus pneumoniae* was found in all fatal cases using PCR methods, along with other bacteria such as *Pasteurella multocida* and *Haemophilus influenzae* and respiratory viruses such as respiratory syncytial virus and human metapneumovirus. In total, in eight of the nine cases at least two pathogens were detected.

As judged by the examination of throat swabs collected from humans working in the Taï chimpanzee project a direct transmission of pathogens between humans and chimpanzees could not be confirmed.

In summary, the cause of the observed respiratory epidemics was a polymicrobial, acute, highly contagious respiratory infection, which resulted in a deadly bronchopneumonia in some cases. Based on molecular and epidemiological studies *Streptococcus pneumoniae* might be endemic in the chimpanzee population and a direct transmission between infected individuals seems possible. The possible influence of predisposing factors and the risk of transspecies transmission are discussed.