Consensus document outlining practical considerations for reducing health risks to African great apes and conservation employees through an occupational health program

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Wildlife Conservation Society's Animal Health for the Environment And Development (AHEAD) Great Apes/Human Health Working Group[1]

Rationale for an Employee Health Program

Risk of disease transmission between humans and great apes in Africa

Poaching and habitat encroachment are key threats to the survival of gorilla and chimpanzee populations in unprotected areas in the wild (Butynski and Kalina 1998). In protected areas, these threats remain but at a reduced level. However, some protected areas are surrounded by highly dense human populations and some host ecotourism.

Historically, concerns regarding disease transmission have dealt with risks posed to humans by pathogens from nonhuman primates. More recently, the detrimental effects of pathogens transmitted from humans to nonhuman primates have been recognized (Cappucci 1972, Heldstab et al 1981, Michel and Huschzermeyer 1998). The fact that humans share 97% or more of their genetic makeup with gorillas and chimpanzees (Sibley and Ahlquist 1984) means that the risk of disease transmission between humans and great apes (anthropozoonosis) is potentially high.

Evidence is accumulating that the habituation process and intensification of human contact between humans and mountain gorillas may facilitate or enhance anthropozoonotic transmission of protozoa and helminthes (Ashford et al 1990, Hastings et al 1992, Nizeyi et al 1999, Gracyk et al 1999 and Mudakikwa et al 1998). In addition, fecal/oral transmitted bacteria (e.g., *Campylobacter and Salmonella)* and viruses such as

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poliovirus, rotavirus and hepatitis A are suspected as potential anthropozoonotic diseases (Homsy 1999; Ott-Joslin 1993).

Some managers in protected areas containing chimpanzees perceive that disease outbreaks have been and continue to be significant causes of mortality for chimpanzees. For example, epidemics at the Gombe National Park in Tanzania include suspected polio in 1966, respiratory diseases in 1968, 1987, 1996, 1999 and 2000 and sarcoptic mange in 1997 (Goodall 1986, Nutter 1996, Pusey 1998). Other great ape study sites reportedly also having been affected by epidemic disease include the Tai Forest, Ivory Coast and Lossi in Gabon (Ebola), and human-ape disease transmission is currently under investigation in mountain gorilla habitats.

Conservation employees as focal human groups

Based on the mounting literature suggesting human disease as a potentially important threat to chimpanzee and gorilla survival in the wild, there is increasing support for improving health in target human populations as a possible means of reducing the risk of morbidity/mortality among wild apes. Humans exposed to wild apes in Africa can be divided into four groups, defined by level of exposure:

* protected area or conservation employees having close exposure, sometimes on a daily basis and, occasionally, direct contact;
* tourists having close exposure, usually 1 or 2 days per person;
* the local community having unintentional and not usually close exposure; and
* military, poachers and other illegal protected area entrants having potentially high habitat use but little close exposure to wild apes.

Differences in how close members of these groups usually get to wild apes, the amount of time spent in proximity and group levels of pathogen infection means that the magnitude of disease risk posed by these four human groups is not equal. Similarly, preventive measures to reduce risk among the groups are not equally feasible or cost-effective. For conservation professionals including wildlife veterinarians, the idea of focusing risk reduction efforts on conservation employees working in great ape protected area habitat is justified because 1) this group has the highest level of routine and close exposure and 2) its exposure-related activity can most easily be managed.

The AHEAD Great Apes/Human Health working group members, among many others, have long considered the above situation. Based on a series of meetings and communications over the past year to address these issues, incorporating lessons learned from the field and the accumulating scientific literature, the group members have come up with the following consensus points:

- *Employee health care should be an integral part of wild ape conservation programs because i) employees are often in frequent close contact with habituated animals; ii) an occupational health program is standard practice for persons working in zoos and laboratories in western*

countries, and iii) such a program is in the manageable interests of conservation organizations because employees can be identified and followed up.

- *To be successful as a conservation-related intervention, however, employee health care needs to be considered a means of protecting <u>both</u> the employees and protected area wildlife.*

- *Protecting employee health should be considered a "critical control point" in terms of protecting the health of wildlife.*

- *Employee health efforts should be delivered as part of a standardized employee health program (EHP).*

- *To the extent possible, the program should be modeled after western country zoo or primate center occupational health programs.*

Proposed Components of an Employee Health Program

An EHP should provide preventive, clinical assessment and case management (referral, follow-up, treatment, as indicated) services to all protected area conservation employees. Wherever feasible and affordable, consideration should be given to providing treatment for members of the employee's immediate family who, by virtue of their continued close contact, potentially pose a risk of infectious disease transmission to the employees and therefore also indirectly to great apes.

<u>Preventive services</u>

Preventive services should be risk-based considering the employee's job type. At a minimum, vaccinations should be offered for diseases for which 1) evidence exists of susceptibility among great apes and 2) the likelihood of population level effects is high if the disease were to be introduced. These include but are not limited to:

- Measles (particularly if employee is field-based and coming within close contact of great apes)
- Polio (injectable-killed vaccine)
- Any other infectious disease of high prevalence endemically or epidemically in the area.

Other vaccinations that should be considered for occupational health reasons include:

- Tetanus (to safeguard the health of employees)
- Rabies (based on cost considerations, endemicity of the disease and possibly whether post-exposure interventions are locally available)
- Hepatitis A

- Hepatitis B

To improve employee health and reduce risk of interspecies helminthic infection, prophylactic de-worming treatment every 3 months should also be considered.

Health education/counseling involving a trained person or team of health professionals and updated health education materials should be included on a routine basis in any EHP.

Key messages that should be covered include:

- Hygiene (including hand washing/disinfection before going to the field and after toilet use)
- Sanitation (including human waste disposal when in the field and at home or/or in the community)
- Family planning (option for condoms to be available and/or referral for other contraceptive methods as supported by national or local non-governmental or governmental programs)
- Prevention of sexually transmitted infections (STI) including HIV (specifically how to reduce infection/transmission through changing risky behaviors and increasing condom use)
- Prevention of specific diseases endemic to the area (e.g. malaria) and/or chronic conditions for which basic lifestyle changes could help (e.g., high blood pressure, diabetes, nutrition-related conditions)

Clinical Assessment

A clinical assessment including a clinical history, physical examination and laboratory work should be provided for each employee on an agreed upon schedule. The clinical history and exam should be conducted by a clinician or team of health providers designated by the program as responsible for this service.

While a conservation organization cannot require anyone to take specific tests or treatment as part of an EHP, conservation employers can request that any employee be healthy enough to do the job for which they are being hired and not have any health condition that would put protected area wildlife at risk. To this end, the assessment should conclude with a signed statement by the designated provider(s) indicating whether, in the clinician's judgment, according to guidelines agreed upon a priori, the (potential) employee passes the stated health criteria for that specific position (or that they can continue to do the work for which they were originally hired). The statement should include a listing of the specific diseases/pathogens of concern to that protected area EHP. If an employee or candidate chooses *not* to be examined or treated, a policy

should exist regarding which positions they are eligible versus ineligible to apply for/carry out.

While testing and treatment cannot be mandated, the following should be considered as part of any routine EHP examination to improve or maintain the health of the employees:

- Urinanalysis (specifically, protein to detect renal problems)
- Blood analysis (smear for malaria if symptomatic and CBC)
- Other diagnostic testing recommended by the program physician based on clinical examination findings.

The following should be considered as a means of improving or maintaining the health of the employees and also potentially protecting wild ape health:

- Tests to detect gastro-intestinal parasites;
- Fecal cultures;
- Tuberculosis (TB) testing (the most sensitive test in that health care context that would allow for infectiousness to be assessed while not overburdening the system with false positive referrals).

  The question of how to interpret TB test results in populations vaccinated with BCG needs to be considered. Research findings support the usefulness/validity of PPD (not other skin) testing with a cutoff point of 10 mm in persons previously vaccinated with BCG (Menzies R and Vissandjee B 1992). HIV+ persons with a CD4 count < 500 however may have unreliable TB PPD test results (Lourdes Garcia-Garcia M et al 2000) and in some program situations, skin testing may not be possible. Additional information on the accuracy of sputum testing in low-resource settings is needed to promote a test (or series of tests) that is adequately sensitive but not associated with a high false positive rate (which could overburden the referral system).

- HIV testing

  HIV testing also cannot be required of employees, however voluntary HIV testing is highly recommended given the relationship between HIV and TB infection rates and the importance of the latter in terms of potential health risks to great apes (beyond the obvious human health implications). If an employee is HIV+ and immunosuppressed (low CD4 count), a country policy may already exist regarding vaccination against certain diseases such as measles. However, measles vaccination is contraindicated only in immmunosuppressed patients, not all HIV+ persons. And, determining who is at risk of immunosuppression may be difficult in many great ape EHP settings.

  Given the potential importance of measles vaccination for field-based personnel, a clinical flow protocol may need to be developed allowing for employees to first receive HIV testing. For any employee testing HIV positive, subsequent CD4

testing may then be considered to assess immunosuppression status, eligibility for measles vaccination and, as relevant, eligibility for HIV treatment as part of a national country program.

Employees testing HIV+ as part of an EHP assessment should be treated similarly to any other HIV + person employed by the same conservation organization. Wherever programs exist, HIV + employees should be referred to the national HIV/AIDS control program for counseling and treatment, as appropriate. EHP clinical providers should actively monitor HIV+ employees for any co-infections that could put protected area animals at increased risk (e.g. TB) and/or recommend that the employee be assigned non-field related duties (for HIV+ employees working in field positions).

The HIV status of each employee should remain strictly confidential between the provider and the employee. As with all EHP information, however, the person administratively managing health care finances for each organization involved may have access to *select* information as it affects billing, treatment cost reimbursements and/or payment disbursements.

Case management including further diagnostic workup, treatment, referral or follow-up care (recommended by the designated EHP clinician) should be provided to employees for diseases/conditions directly affecting their job responsibilities and any on-the-job injuries. The former in particular may be challenging to determine but attempts should be made to do this, to the extent possible, before the EHP has been initiated to avoid misunderstandings or problems during program implementation. Diseases/conditions that could affect the employees' job responsibilities may be listed in the employee contract, as well as any diseases/conditions for which the employee must obtain a clean "bill of health" from the EHP provider as a prerequisite for undertaking specific (e.g. field related) job responsibilities. Conditions that should be treated or covered by the EHP to minimize health risks to great apes include:

- GI parasites
- Respiratory pathogens
- Skin conditions

To ensure longer term program sustainability, employees should be referred for whatever services/programs are available locally in country in the form of national health programs and/or that are covered by available insurance schemes. If an infection, disease or condition is job-related and no national program or insurance exists for that disease/condition, these clinical services should be provided to the employee and covered by the EHP.

For diseases/conditions not related directly to their job responsibilities, case management services not covered by national programs or available insurance schemes should be provided by the EHP at least at a level consistent with the care that would be provided at the most basic health care level in the country (e.g. dispensary). The latter includes basic

first aid and treatment or referral for acute or chronic disease. Care should be taken to minimize disparities in health care received between employees and local community members that could lead to bad relations, while at the same time ensuring adequate employee health services. If coverage of case management services is affordable and feasible for immediate family members residing with employees, the level of care should be the same as that provided at a local dispensary.

Managing an Employee Health Program

The first step in organizing an EHP is to identify all employers associated with the targeted protected area and to get consensus on EHP objectives, components, management and costs. (Possible line items for an EHP budget are provided in Annex 1 below). Next, health and other relevant authorities at the national and local levels need to be informed and commitment to participate and/or approval obtained, ultimately in writing. After official approval has been given, a signed memorandum of understanding (MOU) or equivalent should be obtained from all participating organizations including a full description of the program with respective responsibilities - management and financial. All protected area employers should contribute something to financially supporting the program.

There should be an EHP manager position as part of the program organizational structure for each protected area. This person should be someone:

- with a health background;
- living locally who has relations with the local health care system;
- knowledgeable of/familiar with NGOs in the area; and
- trained in the control of communicable diseases of specific threat to great apes.

The decision regarding how EHP services will be provided needs to be based on the local availability of health care resources. Ideally, there should be a specific time period during the year designated for the clinical assessment of current employees as well as staggered services throughout the year for any potential new employees. If a “bill of good health” is established as a criterion for employment or a pre-placement, the program needs to be able to offer at least some screening services on a staggered basis.

For an EHP to be successful, data confidentiality must be ensured. Data may be aggregated and analyzed for monitoring, evaluation and/or research purposes. Institutional review board (IRB) approval will need to be obtained for any human subjects-related data analysis and write-up, and informed consent procedures (including a form) will need to be incorporated into the clinical assessment process.

To maintain data confidentiality, a master file containing the employees’ names and ID numbers will need to be maintained separately and all other files should contain only the employee ID number (for purposes of electronically linking separate clinical result databases). The relationship/ownership/use of aggregate data should be indicated in any inter-organization MOUs.

As indicated previously, one role of the health care provider should be to determine whether or not the person can be employed (if pre-employment assessment is required) and /or whether they can do the job for which they were hired. Specific medical action and a time frame need to be indicated in writing by the provider(s) if, for medical reasons, the employee cannot continue with the job for which they are (or are applying to be) hired. The program needs to have a clear policy regarding where employees can go and the responsibilities employees would have if, for medical reasons, they cannot be deployed into the field.

In addition to the provider, someone representing the employer (e.g. human resource equivalent) also needs to be aware of any employee work restrictions affecting how the individual's case is *administratively* managed (including how funds are allocated for follow-up care, etc.).

Annex 1: Possible budget line items for an EHP

Personnel (percent person time equivalent for the following categories)

Physician
2 nurses
1 professional to do bacteriology
2 lab technicians
EHP manager
Consultants (database management, program development, program monitoring and evaluation)
Program administration

Clinical supplies

HIV testing supplies
TB testing supplies (Direct sputum smear and culture)
Vacutainers for blood collection
Cryovials
Microscopes
Small fridge for sample storage

Coats
Goggles
Gloves
Slides
Supplies for parasite egg count
Solution for larval culture
Bacterial swabs
Urine dipsticks
Reagents for bacteriology
Fixative

Vaccinations

Polio
Measles
Tetanus toxoid
Hepatitis A (as indicated)
Hepatitis B (as indicated)
Rabies (as indicated)

Treatment

TB treatment (for 8 months)
Antibiotic treatment for enteric infections

Anti-parasitic treatment for intestinal parasites
Corrective lenses/glasses
Anti-hypertensive treatment
HIV treatment (country-specific protocols)

Forms

Paper//carbon

Equipment

Laptop
Printer
Locked file cabinet (for forms)

Communications

Travel

Local
International

Administration

Overhead

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