1. **Title of the Centre:**

   WHO/PAHO Collaborating Center on New and Emerging Zoonoses

2. **Annual report:**  **Year 2003 (covering period 2000-2003)**

3. **Address:**
   
   Veterinary Public Health Laboratory  
   Department of Population Health and Reproduction  
   School of Veterinary Medicine  
   University of California, Davis  
   Davis, CA 95616 USA

4. **Head of Centre:**

   Bruno B. Chomel, DVM, PhD  
   Professor of zoonoses

5. **Terms of reference of the Centre:**

   5.1. Develop appropriate epidemiologic and laboratory methodology, including risk assessment for new and emerging zoonoses:
   
   a) Establish epidemiological analysis methods to predict the trends of new and emerging zoonoses, define appropriate methods of risk assessment of disease introduction by international trade and population migration.
   
   b) Develop diagnostic tools and molecular biological markers for diagnosis and epidemiological relationship between animal and human infections.

   5.2. Conduct laboratory research on new and emerging zoonoses:
   
   a) Develop methods of detection of new emerging pathogens,  
   b) Establish appropriate animal models for experimental reproduction of disease,  
   c) Perform molecular epidemiological studies on new zoonoses agents  
   d) Develop and test in laboratory animals appropriate vaccines or treatments to prevent or cure new and emerging zoonoses.

   5.3. Accept WHO sponsored trainees in epidemiology and diagnosis of new and emerging zoonoses, should resources be made available.

   5.4 Conduct other activities, as requested by and agreed with WHO and its regional offices, toward preventing spread of new and emerging zoonoses.

6. Implementation of the work plan

   6.1. Work performed in relation to the terms of reference:
   
   Name of the activity: Develop appropriate epidemiologic and laboratory methodology, including risk assessment for new and emerging zoonoses:
a) Establish epidemiological analysis methods to predict the trends of new and emerging zoonoses, define appropriate methods of risk assessment of disease introduction by international trade and population migration.

During the last few years Drs Gardner and Carpenter developed several epidemiological analysis methods to evaluate presence of diseases and test accuracy. Even if many of these studies do not implicate directly zoonotic agents, such concepts are fully applicable to new and emerging zoonoses. Dr. Gardner and Carpenter have taken a leading role in this field. The involvement of these Center’s partners is shown through the list of their recent publications, as follows:


Foot and Mouth Disease modeling:


b) Develop diagnostic tools and molecular biological markers for diagnosis and epidemiological relationship between animal and human infections.

Similarly, partners of the Center have been working in developing tools for diagnosis of emerging zoonoses and have analyzed epidemiological trends of some zoonotic diseases, as illustrated by the following publications:


Zoonotic diseases in Non-Human Primates:


Lerche, NW; Switzer, WM; Yee, JL; Shammugam, V; and others. Evidence of infection with simian type D retrovirus in persons occupationally exposed to nonhuman primates. J. Virol., 2001;75:1783-1789.

Blewett, EL; Black, DH; Lerche, NW; White, G; and others. Simian foamy virus infections in a baboon breeding colony. Virology, 2000;278:183-193.


**Water borne zoonotic agents:**
Tate, KW; Atwill, ER; McDougald, NK; George, MR; and others. A method for estimating cattle fecal loading on rangeland watersheds. J. Range Management, 2000;53:506-510.
Tate, KW; Atwill, ER; George, MR; McDougald, MK; and others. *Cryptosporidium parvum* transport from cattle fecal deposits on California rangelands. J. Range Management, 2000;53:295-299.

6.2. **Conduct laboratory research on new and emerging zoonoses:**
   a) Develop methods of detection of new emerging pathogens,
   b) Establish appropriate animal models for experimental reproduction of disease,
   c) Perform molecular epidemiological studies on new zoonoses agents
   d) Develop and test in laboratory animals appropriate vaccines or treatments to prevent or cure new and emerging zoonoses.

Several members of the Center have investigated new and emerging zoonoses. Many of these studies have focused on molecular epidemiology of new and emerging zoonoses, particularly of vector-borne zoonoses, such as *Babesia, Ehrlichia, Bartonella, toxoplasma.*

**Babesia and Toxoplasma:**
Kjemtrup, AM; Lee, B; Fritz, CL; Evans, C; and others. 2002. Investigation of transfusion transmission of a WA1-type babesial parasite to a premature infant in California. Transfusion, 42:1482-1487.
Innes, EA; Andrianarivo, AG; Bjorkman, C; Williams, DJL; and others. 2002. Immune responses to *Neospora caninum* and prospects for vaccination. Trends in Parasitol, 18:497-504.
Miller, MA; Gardner, IA; Kreuder, C; Paradies, DM; and others. 2002. Coastal freshwater runoff is a risk factor for *Toxoplasma gondii* infection of southern sea otters (*Enhydra lutris*
Bartonella:


Ehrlichia/Anaplasma:


West Nile virus:


Other activities:
Review articles:


**Development of a web Site:**

A Web site is being prepared and should be operational by Spring 2004. It will include a series of powerpoint presentations concerning Zoonotic diseases of domestic animals (with update on emerging zoonoses in each species): slide series are made for:

- Zoonoses of dogs part 1: viral and bacterial; part 2: parasitic and mycotic
- Zoonoses of cats
- Zoonoses of Horses
- Zoonoses of ruminants
- Zoonoses of swine
- Zoonoses of birds

A series of 18 lectures on Zoonoses of non-human primates

A few slides sets on Emerging infectious diseases and emerging zoonoses

The web site will also be connected to journals or centers dealing with emerging zoonoses.