DRAFT CONCLUSIONS*

-All developed countries have eliminated canine rabies virus transmission. Increasingly, developing countries are achieving the same, based in part upon the progress demonstrated to date within Latin America. The global elimination of human rabies by dogs (GEHRD) will be accomplished by mass vaccination of dogs and timely and effective human postexposure prophylaxis (PEP), given the considerable burden within the African and Asia-Pacific regions.

-As an outgrowth on the time frame of the GEHRD, the objective of the 'Zero by Thirty' (ZBT) concept is to achieve the prevention of all human rabies cases mediated by dogs by 2030.

-Enhanced rabies surveillance, prevention and control at the global, regional, national and sub-national levels are needed, including:

- Planning, resource allocation and infrastructure
    - Existence of the plans/strategies especially at the national level. Many of the developing countries not national strategic plan to address rabies in either animal or human health sectors or neither.
    - Critical analysis of the existing plan/strategies and develop plan to address identified gaps.
    - Appropriate resource allocation to control rabies at its sources
    - Infrastructure of laboratory diagnostic capability in many countries
- Implementation of surveillance, control and prevention
    - Keeping momentum of the effective measures/strategies to achieve goal to eliminate dog-mediated rabies
    - Practical and effective measures especially
        - Vaccination campaign
        - Enhancing effective surveillance
        - Dog and cat population estimation and registration
    - Scale-up local initiative to the national or regional levels

-Parenteral mass vaccination of dogs is the mainstay of the GEHRD, but other modalities may have relevance to the program. For example, oral rabies vaccination (ORV) of wildlife has occurred over a landscape scale in Europe and North America, leading to the elimination of rabies in major reservoir carnivores, such as foxes and coyotes. The oral vaccination of dogs (OVD) is a natural outgrowth of the concept, application and progress of wildlife ORV. Unfortunately, although several candidates exist, no biologics have been licensed yet for OVD.

-Over the last several decades, pilot trials of OVD have occurred in Africa, Asia and the Americas, including studies in Haiti, India, Thailand and Turkey, among others. Safety and

immunogenicity data have been quite supportive of the consideration of incorporation of OVD into routine mass vaccination programs, as a strategy to reach free-ranging community dogs. Results from risk assessment models have shown a very low probability of adverse events expected from OVD, especially in comparison to obvious public health benefits. Based upon these preliminary findings, affected countries within the Asia-Pacific region should consider the utility of OVD to achieve ZBT. Such pilot trials of OVD in Thailand will provide much needed safety and immunogenicity data for policy makers of this technique.

-New WHO guidelines on pre- and PEP will assist in human rabies prevention and acquisition of the GEHRD.

-Considering the public health implications associated with human or animal vaccination, strict regulatory oversight by a National Control Authority is needed.

-Robust and consistent manufacturing procedures, adherence to production processes, quality control and assurance, batch/lot testing protocols and other requirements for vaccine security is critical to the success of any rabies vaccination program.

-Consistency approach to vaccine manufacturing and testing can be used to confirm product quality. While it works best when built in as a part of product development, the approach can also be applied to existing vaccines.

-A strong regulatory system will help inspire public confidence in the vaccines and the administration schemes; all of which are critical to the success of control programs.

-Manufacturers and regulators need to consider processes that lead to improved vaccines; including quality validated tests that improve non-animal testing systems.

-Development of new and revised International Guidelines need to keep pace with vaccines produced by advanced technologies.

-As new data and products support new Pre-Exposure and Post-Exposure Prophylaxis Regimens International recommendations need to be updated to facilitate their adoption when required by Regulatory Authorities.

-Research systems need to be in place and funded to allow development of safer and more effective biologics. The use of modern manufacturing processes and the introduction of new products and procedures such as reduced dosage through intradermal regimens and nucleic acid base vaccines can contribute to greater vaccine access globally and significantly decrease in the incidence of human rabies.

-Cooperation among regulatory authorities associated with mass vaccination programs often requires cooperation at the ministry level (example: neither Agriculture of Public Health may have authority over dog vaccination but can work together to in a program which can impact veterinary and public health).

-Compared to current veterinary rabies products, many anticipated future innovations may occur in the field of human rabies prophylaxis, including opportunities for: utilization of a single-dose, pre-exposure recombinant rabies virus-simian adenovirus vaccine; improvement of the cross-reactive spectrum of current biologics against a diversity of lyssaviruses, using a chimeric approach; and development of an inexpensive, thermostable, plasmid-launched, live-attenuated, recombinant flavivirus-rabies vaccine. Such applied research and clinical testing will enhance the prevention of human rabies towards the realization of the GEHRD, in tandem to the mass parenteral vaccination of dogs, augmented by OVD.

*The **DRAFT Conclusions** listed above were presented in Session 5, just prior to the conclusion of the meeting. A full meeting report is being prepared for publication in *Biologicals.*