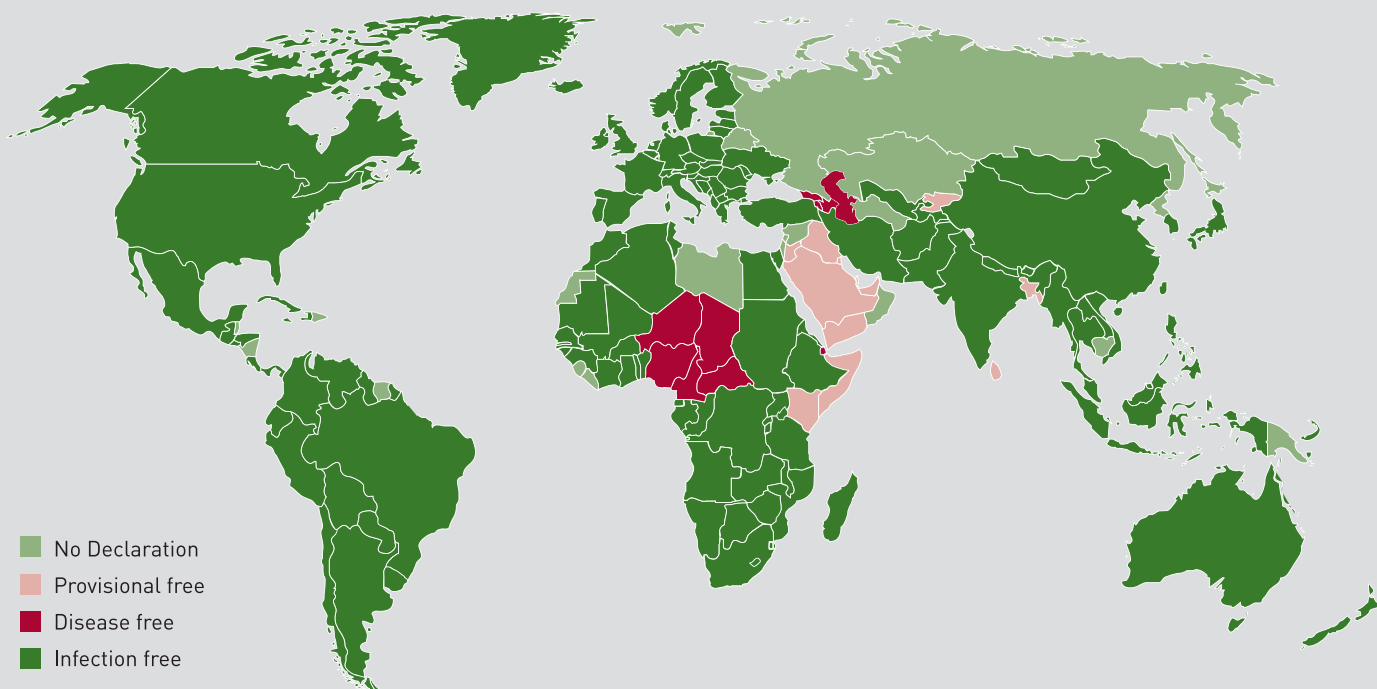




The Global Rinderpest Eradication Programme

Status report on progress made to date
in eradication of rinderpest:
highlighting success story and
action require till global declaration in 2010



RINDERPEST GLOBAL SITUATION (ACCORDING TO THE OIE PATHWAY)

Introduction

Arguably, rinderpest is the most dreaded cattle disease on account of its epidemic history that caused massive depopulations of livestock and wildlife in three continents and responsible for several famines and loss of draught power in agricultural communities of the 18th, 19th and 20th centuries.

FAO's **Emergency Prevention System (EMPRES)** was established in 1994 to strengthen FAO's role in championing the goal of enhanced world food security, through focussing on the prevention and control of transboundary animal diseases and plant pests. The EMPRES-Animal Health vision is "...to promote the effective containment and control of the most serious epidemic livestock diseases, as well as newly emerging diseases by progressive elimination on a regional and global basis through international co-operation involving early warning, early/rapid reaction, enabling research and co-ordination". Thus, while the prime thrust of the **EMPRES-Animal Health component is on rinderpest** it also addresses other priority diseases such as foot-and-mouth-disease (FMD), peste des petits ruminants (PPR), contagious bovine pleuropneumonia (CBPP), Rift Valley fever (RVF), lumpy skin disease, African and classical swine fevers (ASF, CSF), brucellosis, highly pathogenic avian influenza, and Newcastle disease of poultry, among others.

Within EMPRES-Animal Health, the **Global Rinderpest Eradication Programme (GREP)**, and its Secretariat, focuses its activities to facilitate the following aims:

- Developing an understanding of the epidemiology of the virus as an adjunct to eradication;
- Development of appropriate disease surveillance techniques;
- Provision of support to national laboratory services in support of serological surveillance activities;
- Assistance to national veterinary services in organising intensive and sustained surveillance programmes;
- Assistance to national veterinary services in conforming to relevant OIE (World Organisation for Animal Health, Paris) guidelines for declarations of freedom from disease and infection;

- Articulating an effective strategy for prevention or response to the re-introduction of rinderpest virus;
- Developing effective national/regional emergency plans including a pre-rehearsed action programme in case of an outbreak;
- Promoting the use of high quality vaccines independently tested for efficacy and safety; and,
- When epidemiologically appropriate, assisting with coordination of focussed vaccination campaigns leading to a verifiable elimination of persistent endemicity.

Since 1996, FAO convened a series of critical meetings in Rome, Africa, Middle East and Asia to review in-depth the GREP Strategy and advice accordingly in view of the 2010 milestone for rinderpest eradication. The theme of the first Technical Consultation (1996) was: "The World Without Rinderpest" and the Expert Consultation drew up a blueprint for the Global Eradication by the year 2010.

Late in the 1980's, the **FAO/IAEA** (International Atomic Energy Agency, Vienna) initiated a large laboratory network of trained scientists that linked with the Animal Health Service section responsible for infectious diseases (later to be EMPRES). This joint effort contributed to dramatic improvement in information gathering, laboratory proficiency, and monitoring of disease and vaccination efficacy and coverage in national and reference laboratories to support rinderpest eradication and outbreak management campaigns. Indeed, having a vibrant network of laboratories was of great value to GREP and provided tools and personnel able to discuss and analyse data on which to base assessments of the rinderpest disease status nationally, regionally and globally.

Current Status

In South Asia and India: India's confirmation in 1995 of having succeeded in eradicating rinderpest after the last reservoirs of infection were identified and eliminated in Tamil Nadu and Karnataka was only recognised rinderpest infection-free by the OIE in 2004. China was declared infection free in May 2008.

Southeast Asia: South East Asia has likely been free from rinderpest since the late 1950s (with a possible, but unlikely

FAO SUPPORT TO COUNTRIES IN 2009 AND 2010

Activities	Countries
Assistance for rinderpest dossier formulation	Bangladesh, Cambodia, Comoros, Kosovo, Liberia, Sao Tome e Principe.
Dossiers only to be submitted to OIE	Gambia, DPR Korea, Laos, Sierra Leone
Assistance for strategy development, kits and sampling	Azerbaijan, Cameroon, Central African Republic, Chad, Djibouti, Georgia, Israel, Kazakhstan, Kuwait, Nigeria, Niger, West Bank and Gaza, Qatar, Russia, Saudi Arabia, Somalia, Sri Lanka, Syria, United Arab Emirate and Yemen
Sampling undertaken awaiting kits from FAO	Azerbaijan, Cameroon, Djibouti, Kuwait, Nigeria, Niger, Somalia, Syria and Yemen
Surveillance needs to be undertaken	Central African Republic, Chad, Georgia, Israel, Kazakhstan, Qatar, West Bank and Gaza, Saudi Arabia, Sri Lanka and United Arab Emirate

and unconfirmed, suggestion that it could have persisted in Viet Nam until the 1970s). Elsewhere in Asia, surveillance exercises provide evidence that other reservoirs of infection had also been resolved at about that time. Although Mongolia presented convincing evidence of freedom, there can be little doubt that the Russian Federation is really free from infection but this needs to be officially recognised by the international community. Sporadic rinderpest outbreaks in Georgia SSR (late 1989 continuing into early 1990), Siberia/Mongolia (1991 to 1993) and the Amur region of Russia SSR (1998) can with little doubt be ascribed to reversion to virulence of the vaccine used in an attempt to create an immunised buffer zone on the borders of the former USSR and later the Russian Federation with neighbouring countries. Few countries need to complete the accreditation process by end 2009 (Table above).

Central Asia: Rinderpest has not been reported in central Asian states for several decades. However, there was no valid data available to prove the absence of the virus activity in the region. Under an Italian-funded project technical assistance was provided to implement regional activities and surveillance methodology and data on the presence or absence of a viral rinderpest foot print. All beneficiary countries, Pakistan (2007), Afghanistan (2007), Tajikistan (2007) and Uzbekistan (2008) have submitted their dossier for rinderpest infection freedom to the OIE and were all accepted as infection free countries. Infection freedom statuses were granted to the following: Armenia (2009), Belarus (2008), Brunei (2009), Kyrgyzstan (2009), and Serbia (2008) through FAO regular programme and Irish funds.

Near East: All countries in the Middle East region are committed to the GREP deadline of 2010 and few of them are already been accepted as infection free countries. No clinical cases have been reported in the region for more than 10 years. Turkey, Iraq (2009), Iran (2008), Oman (2009), Jordan (2008) and Lebanon (2008) have already been declared infection free.

Africa. Rinderpest virus of African lineage I persisted in Ethiopia until 1995 (at which time an epidemic extended into the areas today regarded as Eritrea) and in Sudan until 2001. In both countries, extensive serological monitoring of young livestock born after the last applications of vaccines in the region and exhaustive participatory disease search approaches offered convincing evidence of the absence of virus circulation. These were the last strongholds of African Lineage I rinderpest virus which has almost certainly joined the Asian Lineage in being consigned to history (though isolates remain for experimental purposes in some laboratory repositories around the world).

In Africa, the OIE Pathway accreditation process has provided assurances in that both West and Central Africa have been free from rinderpest since the last cases occurred in the Burkina Faso/Ghana border in 1988. Northern and Southern Africa have been free for over a century, with the exception of Egypt which reported its last outbreak in 1987.

The Somali Ecosystem in Africa

The rinderpest virus strains of the lineage II have been suspected to be endemic in the Somali Ecosystem, an area covering southern Somalia and the adjoining parts of Ethiopia and Kenya. In 1994, African lineage 2 rinderpest virus was detected in East Africa after an apparent absence of more than 30 years. By 2004 only the Somali ecosystem remained as suspect as the last unresolved focus of rinderpest (based on serological evidence) of infection remained. This area has been the subject of considerable attention over recent years. Several serological studies conducted between 2002 and 2007 revealed some positive findings suggesting possible virus circulation and a possible undetected focus of active rinderpest virus activity of lineage II. The concern that virus was continuing to circulate instigated FAO-GREP and AU-IBAR to undertake follow-up field investigations in late 2007, focusing on sero-positive sites in Gedo, Lower Juba and Middle Juba of Southern Somalia, and the adjacent parts of Kenya and Ethiopia. Re-sampling and re-testing of sites revealed that the sero-positivity seen earlier was due to mis-ageing of sampled animals who had a past vaccination history. Confidence that rinderpest is no longer circulating, were augmented by the repeatedly serological negative results obtained from wildlife carried out in rinderpest susceptible species in the same region between 2002 and 2007. Ethiopia was declared infection free in 2008 and Kenya hopefully in 2009.

GREP success story

Target achieved: the last known rinderpest outbreak was reported in 2001. Based on the above investigations, we are confident to conclude that the African lineage II may have also joined other lineages as extinct. Within this programme, GREP has assumed responsibility for assisting the veterinary services of rinderpest-affected countries eliminate the infection, halt vaccination, and develop evidence relating to the demise of the infection through clinical disease searches, serological surveillance sampling, contingency planning, and laboratory support. Furthermore, GREP has expressed all this effort in accordance with the rules developed by the OIE – the body ultimately responsible for evaluating and adjudicating on the country officially submitted evidence of disease eradication.

Partnership and donors support: GREP counted on the partnership with the OIE, economic blocs or regional specialised organisations, such as the African Union, South Asian Association for Regional Cooperation and numerous donor agencies such as the European Commission, United States Agency for International Development, UK's Department for International Development, the government of Ireland and Italy's (Cooperazione Italiana) and several others. However, the most important partners of GREP have been the countries

themselves. In several situations, FAO's Technical Cooperation Programme project funding has been used to excellent effect to control rinderpest outbreaks rapidly or undertake activities to promote laboratory diagnostic strengthening, emergency preparedness planning, surveillance, and capacity building. Few donors have this rapid response capability and it is a function that is highly appreciated by recipient countries. GREP has also been instrumental in drafting and revising the OIE Pathway (a standard setting activity), surveillance strategies and others guidelines which lead to the confirming eradication.

Promoting vaccination: The strategy that has been adopted early in the global rinderpest eradication was the implementation of widespread vaccination campaigns of cattle and buffaloes.

Virus characterisation: Following molecular analyses, rinderpest virus strains are grouped into three lineages: the lineages I and II being from Africa while lineage III is composed of virus strains isolated from Asia and Middle East.

Rinderpest Eradication Campaign Co-ordination: It was agreed during the FAO Expert Consultation meeting held in Rome in 1992 that regional coordination of campaigns would be the only realistic approach to rinderpest control as isolated national actions would only lead to sporadic and unsustainable or temporary improvements. The GREP incorporated the concept of a coordinated Pan African Rinderpest Campaign (PARC) which covered 34 countries in Africa until 1999 and a West Asian Rinderpest Eradication Campaign (WAREC), which was to cover 11 countries in the Near East Region. WAREC had an early co-ordinating role between 1989 to 1994. The PARC was followed by the programme for Pan-African Control of Epizootics (PACE) with 30 countries and the Somali Ecosystem Rinderpest Coordination Unit (SERECU I and II) regrouping Ethiopia, Kenya and Somalia. The activities have included epidemiological support and technical assistance to the Pan-African Vaccine Centre (PANVAC) in Ethiopia. The complex and the maintenance of good relationships between the agencies were – and are – critical to the success of GREP.

Network in epidemiology and laboratories: Only through international coordination can transboundary animal diseases such as rinderpest be eliminated. Concerted efforts by national authorities, with the assistance of reference laboratories for confirmatory diagnosis or vaccine development and quality control and investment of the international community for the establishment of regional approaches and networks of laboratories and epidemiological units, have placed the world on the threshold of worldwide eradication in the wild of a second pathogen after the smallpox.

Disease surveillance and participatory disease search: Aspect of epidemiology, risk based surveillance; participatory disease search techniques have been developed and were essential for the detection of rinderpest, for providing the epidemiological understanding of disease maintenance, and for gaining assurance of the disappearance or eradication of the disease.

Remaining activities

Surveillance: Awareness raising campaign undertaken on the progress of GREP and to ask for support to the final declaration of rinderpest freedom by FAO and OIE. Support is still needed for countries to undertake surveillance, laboratory testing and dossiers formulation (Annex 1). FAO has invested in a regional Africa TCP/RAF/3202 "Surveillance for accreditation for freedom from rinderpest" (Cameroon, Central African Republic, Chad, Djibouti, Kenya, the Niger and Nigeria) to

assist country recognition. The National TCP/YEM/3101 is also supporting Yemen for the surveillance activities. Through European Commission support, FAO jointly with African Union Inter-African Bureau (AU-IBAR) and NGOs, is coordinating the final confirmation of eradication of rinderpest in the Somali Ecosystem. Others countries not supported with the above are supported through an Irish trust fund or FAO/EMPRES regular programme budgets. This support comprise: technical assistance for surveillance strategy formulation, field surveillance, and provision of testing kits for animal samples collected during field surveillance and technical assistance for dossiers formulations.

Joint FAO-OIE committee for rinderpest global declaration: This Committee will monitor the process which will bring to global recognition the Declaration of the Eradication of Rinderpest and will be charged in producing a comprehensive report of its findings to the DG's of both organisations. It will work on the basis of the information given by the GREP Secretariat with regard to regional, global and country epidemiological and scientific evidence and approaches and by the OIE Ad hoc Group on rinderpest with regard to country submissions (dossiers presented by the countries to its Ad hoc Group and reviewed by the Scientific Committee). The FAO-OIE Committee would be allowed to review findings of all possible documents and data related to the claimed, previously known and current rinderpest situations. The Terms of Reference of this Committee will be developed by FAO and OIE and the GREP Secretariat could serve as Secretariat to the Committee.

Biological materials survey: Mechanism to arrive at an international agreement for a list of laboratories where viruses and sera can be maintained for research purposes and where vaccine master seeds and vaccine banks will be put in place and kept under appropriate biosecurity conditions. A post eradication strategy which will include the declaration that all viruses, biological samples and vaccines have been destroyed in any places other than the laboratories mentioned above will also have to be defined.

Historical account of rinderpest eradication: Historical account of rinderpest eradication written by key players from Africa, the Middle East, Asia, key countries where the disease occurred during the last decades and recognised experts which will include the unfolding of events that led to eradication, the tools developed, the advances and the defeats. Also highlighted will be the donor contributions towards the eradication, the economic impact of the eradication and lessons learnt that may be used for controlling and eliminating other transboundary animal diseases.

Formulation of the post rinderpest-declaration strategy: The strategy for the monitoring of the rinderpest situation after eradication will be drafted and funds identified for its implementation. Activities (Historical account, biological materials survey) above could also enter in the post eradication phase.

Conclusion

Though the eradication of rinderpest has been met by several obstacles over tens of decades, the disease is at an almost undetectable level in the last 15 years, and certainly for the past seven years. As of early 2009, we believe that the virus has been eliminated from Europe, Asia, Middle East, Arabian Peninsula, and all of Africa. This has been a remarkable achievement for veterinary science and evidence of national commitments to a public good as well as a victory for the international community.