



UNISDR Scientific and Technical Advisory Group Case Studies - 2015 Global Rinderpest (Cattle Plague) Eradication: Hazard Elimination Model for Risk Reduction

The problem

Rinderpest or cattle plague is a viral disease of domestic cattle and other large domestic and wildlife ruminant species. It has up to 100% mortality in susceptible herds. It has a long history as first reported between 376 and 386 AD of causing devastating livestock losses with critical impacts on livelihoods, food security, trade, economic development and societal stability. For example, from 1939-1941 China lost over 1 million cattle to Rinderpest with concomitant losses of milk, meat, farm traction, and fertilizer resulting in severe economic and agricultural production losses. In Africa in addition to the direct production losses there were significant losses due to transport and trade restrictions. Rinderpest and control of the disease was the impetus behind the establishment of modern veterinary colleges beginning with the first in Lyon, France in 1761, the establishment of the inter-governmental Organization International Epizootic (OIE-current World Organization for Animal Health) in 1924 and the Food and Agriculture Organization of the United Nations (FAO) in 1945.

The science

Science and technology activities played an essential role in Rinderpest eradication. Programs for control and eradication required research and study into the understanding of the epidemiology of the disease and development of husbandry and sanitary procedures to minimize spread. The development, standardization and production of safe, effective, stable vaccines required intense scientific and technical collaborative effort. Science based disease

surveillance systems were developed including the establishment of laboratory testing methods, standardized reagents, and laboratory facilities was also essential. Science based policy was necessary to

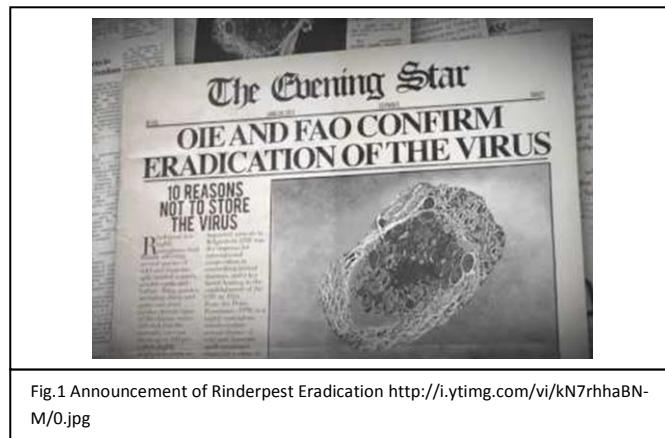


Fig.1 Announcement of Rinderpest Eradication <http://i.ytimg.com/vi/kN7rhhaBNM/0.jpg>

The application to policy and practice

The Rinderpest eradication program model is applicable to other local, regional, and global hazard and disaster risk reduction issues. The Rinderpest eradication in Africa was led by the Pan African Rinderpest Campaign (PARC) with support of numerous governmental and non-governmental organizations. Policies and practices implemented that led to the successful eradication include: national policies to support transparent surveillance

Dr. Gary Vroegindeweij, Lincoln-Memorial University, Chair ad hoc group, World Organization for Animal Health

and reporting, the use of imported vaccines, engaging local leaders, training of local community animal health workers, establishing shared regional diagnostic centres, and the coordination of vaccination campaigns across national boundaries. This required leadership, resourcing, science based applications and commitment to the regional program which are all elements of successful risk reduction programs.

Did it make a difference?

In a word yes. For example the Pan African Rinderpest Campaign of vaccination cost an estimated €51.6 million at an average cost of €0.42 per animal. The estimated avoided losses were estimated at €99.2 million giving a benefit-cost ratio of 85:1. (2) These avoided

losses will continue into the future with little additional cost for ongoing surveillance. There is still continued work to be done to control and eliminate where appropriate laboratory stocks of Rinderpest used for study and vaccine development. Alternative cross reactive vaccines that are not Rinderpest based are being studied currently. This program is an example of Disaster Risk Reduction by the elimination of a hazard through science and technology advanced by OIE, FAO and other collaborating partners.



Fig.2 Cows dead from Rinderpest in South Africa, 1896 Source:
http://en.wikipedia.org/wiki/Rinderpest#/mediaviewer/File:Rinderpest_1896-CN.jpg

References

1. Roeder P., Rich K. The Global Effort to Eradicate Rinderpest, Food Policy Research Institute (2009)
2. Roeder, P. Ridding the World of Rinderpest, Department of International Development (2010)
3. Taylor, W.P., P.L. Roeder, and M.M. Rweyemamu, (2006) Use of Rinderpest vaccine in international programmes for the control and eradication of Rinderpest. In Barrett, T., P.P.
4. Pastoret, and W. Taylor (eds.) Rinderpest and peste des petits ruminants: Virus plagues of large and small ruminants, Elsevier: Amsterdam (2006)
5. Scott, G. R., and A. Provost. Global eradication of Rinderpest. Background paper prepared for the FAO Expert Consultation on the Strategy for Global Rinderpest Eradication, October 1992, Rome
6. Mariner, J. C., and P. L. Roeder. 2003. The use of participatory epidemiology in studies of the persistence of Rinderpest in east Africa. *Veterinary Record* 152 (21): 641–647.