CEDOC Informativo/Newsletter

**N. 99 Octubre / October 2011**

# Centro de Documentación / Documentation Center

## Objetivos/ Objectives

Identificar y atender las necesidades de información, adquisición, organización, almacenamiento, generación, uso y difusión de la información en salud pública veterinaria y proveer recursos bibliográficos técnicos-científicos al equipo de profesionales de la unidad y a los usuarios externos.

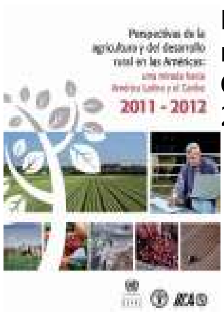
Identify and take care of the needs of information, acquisition, organization, storage, generation, use and diffusion of the information in veterinary public health and provide technical scientific bibliographical resources to the professional staff of the unit and to the users external.

## Temas de interés general / Subjects of general interest


http://www.paho.org/annual-report-d-2011/default.html

## Informaciones disponibles en formato electrónico / Information available in electronic format

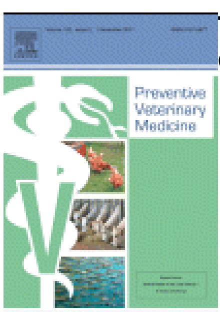
### Agricultura, Ganadería – America Latina / Agriculture, Livestock – Latin America



**Perspectivas de la agricultura y del desarrollo rural en las Américas: una mirada hacia América Latina y el Caribe 2011-2012**
CEPAL, FAO, IICA
2011

Este documento ha sido elaborado conjuntamente por la Comisión Económica para América Latina y el Caribe (CEPAL), la Oficina Regional para América Latina y el Caribe de la Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO) y el Instituto Interamericano de Cooperación para la Agricultura (IICA).
En este número se enfatiza la importancia de que los países cuenten con **instrumentos de política diferenciados para atenuar los efectos de la mayor volatilidad de los precios** (incluido el tipo de cambio) en los ámbitos social, productivo y macroeconómico. Se postula también la necesidad de contar con políticas integrales para **abordar los efectos de la mayor variabilidad climática en la agricultura**, pues en un contexto de cambio climático es un factor adicional que contribuye a incrementar la volatilidad de los precios agrícolas.
La tendencia de largo plazo al alza de los precios de las materias primas agrícolas brinda una oportunidad para la agricultura de América Latina y el Caribe, porque en la región hay tierra disponible que puede incorporarse al esfuerzo productivo, así como una abundancia relativa de agua, biodiversidad y recursos humanos que es posible capitalizar.
En el documento se recomienda aprovechar este potencial con políticas de desarrollo productivo dirigidas a **fomentar la producción de alimentos, promover una mayor participación de la agricultura familiar en el proceso e incentivar un uso sostenible de los recursos naturales**. El objetivo debe ser mejorar los aportes de la agricultura y las actividades relacionadas a la generación de ingresos y empleos. Asimismo, se recomienda **potenciar la ganadería, la acuicultura y el desarrollo forestal comunitario en el ámbito de la agricultura familiar campesina**, diseñando esquemas alternativos que garanticen la producción sostenible de alimentos y contribuyan a la seguridad alimentaria y nutricional.
**Text in Spanish**
http://www.fao.org/docrep/014/am942s/am942s00.pdf

### Brotes de Enfermedades - Modelo Espacial / Disease Outbreaks - Spatial Modelling




**The effect of neighbourhood definitions on spatio-temporal models of disease outbreaks: separation distance versus range overlap**
Laffan SW, Wang Z, Ward MP.
Prev Vet Med. 2011 Dec; 102 (3): 218-29

The definition of the spatial relatedness between infectious and susceptible animal groups is a fundamental component of spatio-temporal modelling of disease outbreaks. A common neighbourhood definition for disease spread in wild and feral animal populations is the distance between the centroids of neighbouring group home ranges. This distance can be used to define neighbourhood interactions, and also to describe the probability of successful disease transmission. Key limitations of this approach are (1) that a susceptible neighbour of an infectious group with an overlapping home range - but whose centroid lies outside the home range of an infectious group - will not be considered for disease transmission, and (2) the degree of overlap between the home ranges is not taken into account for those groups with centroids inside the infectious home range. We assessed the impact of both distance-based and range overlap methods of disease transmission on model-predicted disease spread. Range overlap was calculated using home ranges modelled as circles. We used the Sirca geographic automata model, with the population data from a nine-county study area in Texas that we have previously described. For each method we applied 100 model repetitions, each of 100 time steps, to 30 index locations. The results show that the rate of disease spread for the range-overlap method is clearly less than the distance-based method, with median outbreaks modelled using the latter being 1.4-1.45 times larger. However, the two methods show similar overall trends in the area infected, and the range-overlap median (48 and 120 for cattle and pigs, respectively) falls within the 5th-95th percentile range of the distance-based method (0-96 and 0-252 for cattle and pigs, respectively). These differences can be attributed to the calculation of the interaction probabilities in the two methods, with overlap weights generally resulting in lower interaction probabilities. The definition of spatial neighbourhood has important implications for models used in decision-support systems for disease preparedness and response. This research presents a first step towards more realistic representations that could be used in spatio-temporal models of disease outbreaks.
**Text in English**

## Brucelosis / Brucellosis

**Estado da arte da brucelose em humanos [The current state of brucellosis in humans]**
Lawinsky MLJ, Ohara PM, Elkhoury MR, Faria NC, Cavalcante KRLJ
Rev Pan-Amaz Saude 2010 Dec; 1 (4): 75-84

Brucellosis, an infectious disease caused by bacteria of the genus *Brucella*, has drawn the attention of healthcare providers worldwide because it causes occupational diseases and is regarded as an emerging disease and a potential agent for bioterrorism by the World Health Organization. Brazil does not have a structured public health network for brucellosis diagnosis in humans. This work aims to provide an update on its main aspects of this disease. A systematic literature review

was conducted for this purpose. Etiological, clinical, epidemiological and diagnostic aspects were reviewed, among others, in order to update professionals and researchers in the field. A total of 31 articles were found, of which 28 were used. This review shows that many aspects of pathogenesis, prevention, diagnosis and therapy of the disease are not yet fully understood, but substantial progress has been made in understanding the molecular basis of *Brucella* genetics and the pathogenesis of infection. We conclude by stating the importance of standardizing the diagnostic procedures of the disease because surveillance measures are imposed based on data provided by these diagnoses.
**Text in Portuguese**
http://scielo.iec.pa.gov.br/pdf/rpas/v1n4/v1n4a12.pdf

## Cambio Climático – Salud Animal / Climate Change – Animal Health


**The impacts of climate change on animal health and economy: a way forward for policy option**

Abul Quasem Al-Amin, Gazi Mahabubul Alam

Asian Journal of Animal and Veterinary Advances 2011; 6 (11): 1061-8

The national policy of developing countries is fundamentally suffered forclimate change related research of animal health impacts, lack of policy alteration in emergency situations and lack of scenario research for impacts on ecosystem, distant animal health forecast, disease spread and migration. This study brings together the climate change issue and impacts on animal health and economy and it's affecting factors to propose more effective strategies to control this social issue. Here, we emphasize prioritizing policy approaches of knowing how preferences and climate may change in the distant future and selection of policy alternatives over which impacts are most relevant. The sound effective policy can be developed in the developing economy when there is an inter-linkage within each principal component such as on (a) national priorities, (b) specific research on climatic animal health impacts, (c) scenario research of climate change in distant future, (d) alternative policy alteration in natural disaster and emergency and (e) global outbreak of animal health impacts. This study attempts to investigate the inter-linkage of these indications and the possible planning lacking and concern focusing on climate change on animal health factors. The experiences from this study can be used forclimate change related animal health impacts and potential economic policy in developing countries.

**Text in English**

http://scialert.net/qredirect.php?doi=ajava.2011.1061.1068&linkid=pdf


**The impact of climate change and other factors on zoonotic diseases**

Naicker PR

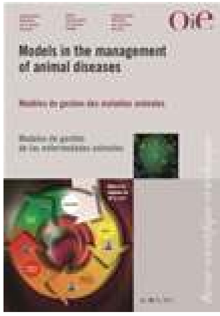
Archives of Clinical Microbiology 2011; 2 (2): 4

Approximately 60% of emerging human pathogens are zoonoses. The complex nature of the human-animal interface is constantly influenced by the effects of climate change, anthropogenic and natural factors. Geoclimatic change most markedly affects zoonotic diseases transmitted by arthropod vectors. Travel, tourism and trade are the major human factors impacting the epidemiology of zoonotic diseases. The re-emergence of zoonotic diseases is also driven by pathogen adaptation and animal migration. All these factors converge to make zoonotic diseases such as West Nile fever and Lyme disease of great public health concern in the developed world. However, the effects of climate change are predicted to be worse for the developing world where challenging socioeconomic and political environments are exacerbated by a lack of epidemiological studies on zoonotic diseases.

**Text in English**

http://imedpub.com/ojs/index.php/acmicrob/article/view/305/253

## Determinación Cuantitativa del Riesgo – Modelos / Quantitative Risk Assessment – Models




**The role of models in estimating consequences as part of the risk assessment process**
Forde-Folle K, Mitchell D, Zepeda C
Rev Sci Tech. 2011 Aug; 30 (2): 541-5

The degree of disease risk represented by the introduction, spread, or establishment of one or several diseases through the importation of animals and animal products is assessed by importing countries through an analysis of risk. The components of a risk analysis include hazard identification, risk assessment, risk management, and risk communication. A risk assessment starts with identification of the hazard(s) and then continues with four interrelated steps: release assessment, exposure assessment, consequence assessment, and risk estimation. Risk assessments may be either qualitative or quantitative. This paper describes how, through the integration of epidemiological and economic models, the potential adverse biological and economic consequences of exposure can be quantified.
**Text in English**
http://web.oie.int/boutique/extrait/14fordefolle541545.pdf

## Enfermedad de los Animales – Emergencias / Animal Diseases – Emergency

**Good emergency management practices: the essentials**
Edited by Nick Honhold, Ian Douglas, William Geering, Arnon Shimshoni and Juan Lubroth
FAO (FAO Animal Production and Health Manual, No. 11)
2011

The aim of this manual is to set out in a systematic way the elements required to achieve that level of preparedness for any emergency disease in animals. In particular, but not exclusively, this manual focuses on the control of transboundary animal diseases (TADs). Some of these principles may also be helpful in preparing for food safety, zoonotic and even non-infectious disease emergencies.
**Text in English**
http://www.fao.org/docrep/014/ba0137e/ba0137e00.pdf

## Epidemiología - Modelos / Epidemiology – Models


**Adapting existing models of highly contagious diseases to countries other than their country of origin**
Dubé C, Sanchez J, Reeves A
Rev Sci Tech. 2011 Aug; 30 (2): 581-9

Many countries do not have the resources to develop epidemiological models of animal diseases. As a result, it is tempting to use models developed in other countries. However, an existing model may need to be adapted in order for it to be appropriately applied in a country, region, or situation other than that for which it was originally developed. The process of adapting a model has a number of benefits for both model builders and model users. For model builders, it provides insight into the applicability of their model and potentially the opportunity to obtain data for operational validation of components of their model. For users, it is a chance to think about the infection transmission process in detail, to review the data available for modelling, and to learn the principles of epidemiological modelling. Various issues must be addressed when considering adapting a model. Most critically, the assumptions and purpose behind the model must be thoroughly understood, so that new users can determine its suitability for their situation. The process of adapting a model might simply involve changing existing model parameter values (for example, to better represent livestock demographics in a country or region), or might require more substantial (and more labour-intensive) changes to the model code and conceptual model. Adapting a model is easier if the model has a user-friendly interface and easy-to-read user documentation. In addition, models built as frameworks within which disease processes and livestock demographics and contacts are flexible are good candidates for technology transfer projects, which lead to long-term collaborations.
**Text in English**
http://web.oie.int/boutique/extrait/18dube581589.pdf


**Approaches for evaluating veterinary epidermiological models: verification, validation and limitations**
Reeves A, Salman MA, Hill AE
Rev Sci Tech. 2011 Aug; 30 (2): 499-512

The evaluation of models of the spread and control of animal diseases is crucial if these models are to be used to inform decisions about the control or management of such diseases. Two key steps in the evaluation of epidemiological models are model verification and model validation. Verification is the demonstration that a computer-driven model is operating correctly, and conforms to its intended design. Validation refers to the process of determining how well a model corresponds to the system that it is intended to represent. For a veterinary epidemiological model, validation would address such issues as how well the model represents the dynamics of the disease in question in the population to which this model is applied, and how well the model represents the application of different measures for disease control. Just as the development of epidemiological models is a subjective, continuous process, subject to change and refinement, so too is the evaluation of models. The purpose of model evaluation is not to demonstrate that a model is a 'true' or accurate' representation of a system, but to subject it to sufficient scrutiny so that it may be used with an appropriate degree of confidence to aid decision-making. To facilitate model verification and validation, epidemiological modellers should clearly state the purpose, assumptions and limitations of a model; provide a detailed description of the conceptual model; document those steps already taken to test the model; and thoroughly describe the data sources and the process used to produce model input parameters from those data.
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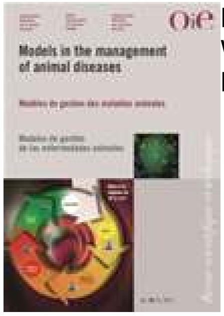


**Epidemiological models to support animal disease surveillance activities**
Willeberg P, Paisleyl LG, Lind P
Rev Sci Tech. 2011 Aug; 30 (2): 603-14

Epidemiological models have been used extensively as a tool in improving animal disease surveillance activities. A review of published papers identified three main groups of model applications: models for planning surveillance, models for evaluating the performance of surveillance systems and models for interpreting surveillance data as part of ongoing control or eradication programmes. Two Danish examples are outlined. The first illustrates how models were used in documenting country freedom from disease (trichinellosis) and the second demonstrates how models were of assistance in predicting the risk of future cases, detected and undetected, of a waning infection of bovine spongiform encephalopathy. Both studies were successful in advancing European policy changes to reduce the cost of surveillance to appropriate levels given the magnitude of the respective hazards.
**Text in English**
http://web.oie.int/boutique/extrait/20willeberg603614.pdf


**Introduction to network analysis and its implications for animal disease modelling**
Dubé C, Ribble C, Kelton D, McNab B
Rev Sci Tech. 2011 Aug; 30 (2): 425-36

Social networks analysis (SNA) has recently been used in veterinary epidemiology to study livestock movements. A network is obtained by considering livestock holdings as nodes in a network and movements among holdings as links among nodes. Social networks analysis enables the study of the network as a whole, exploring all the relationships among pairs of farms. Highly connected livestock holdings in the network can be identified, which can help surveillance and disease prevention activities. Observed livestock movement networks in various countries have shown an important level of contact heterogeneity and clustering (topological, not necessarily geographical or spatial) and understanding the architecture of these networks has provided a better understanding of how infections may spread. The findings of SNA studies of livestock movement should be used to build and parameterise epidemiological models of infection spread in order to improve the reliability of the outputs from these models.
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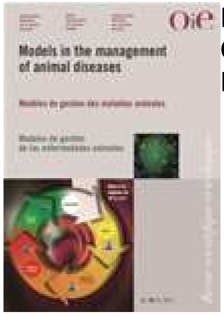


**Principles of epidemiological modelling**
Garner MG, Hamilton SA
Rev Sci Tech. 2011 Aug; 30 (2): 407-16

Epidemiological modelling can be a powerful tool to assist animal health policy development and disease prevention and control. Models can vary from simple deterministic mathematical models through to complex spatially-explicit stochastic simulations and decision support systems. The approach used will vary depending on the purpose of the study, how well the epidemiology of a disease is understood, the amount and quality of data available, and the background and experience of the modellers. Epidemiological models can be classified into various categories depending on their treatment of variability, chance and uncertainty (deterministic or stochastic), time (continuous or discrete intervals), space (non-spatial or spatial) and the structure of the population (homogenous or heterogeneous mixing). The increasing sophistication of computers, together with greater recognition of the importance of spatial elements in the spread and control of disease, mean that models which incorporate spatial components are becoming more important in epidemiological studies. Multidisciplinary approaches using a range of new technologies make it possible to build more sophisticated models of animal disease. New generation epidemiological models enable disease to be studied in the context of physical, economic, technological, health, media and political infrastructures. To be useful in policy development, models must be fit for purpose and appropriately verified and validated. This involves ensuring that the model is an adequate representation of the system under study and that its outputs are sufficiently accurate and precise for the intended purpose. Finally, models are just one tool for providing technical advice, and should not be considered in isolation from data from experimental and field studies.
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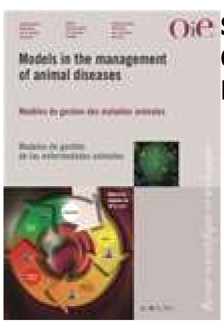


**Stochastic, spatially-explicit epidemic models**
Carpenter TE
Rev Sci Tech. 2011 Aug; 30 (2): 417-24

Animal disease epidemic models are useful for better understanding both the spread and control of disease in a population. While it is advisable that models be only as complex as needed, it is often necessary to modify simplifying assumptions and thus increase model complexity to better reflect reality. Here, the author will examine the need for increasing model complexity by including randomness in a model and modifying the assumption of homogeneous mixing, by introducing a spatial component into the model. The costs and benefits of these changes will be examined.
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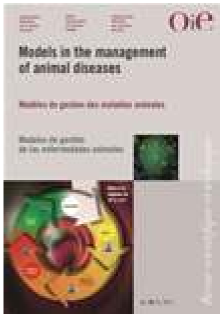


**The use of modelling to evaluate and adapt strategies for animal disease control**
Saegerman C, Porter SR, Humblet MF.
Rev Sci Tech. 2011 Aug; 30 (2): 555-69

Disease is often associated with debilitating clinical signs, disorders or production losses in animals and/or humans, leading to severe socio-economic repercussions. This explains the high priority that national health authorities and international organisations give to selecting control strategies for and the eradication of specific diseases. When a control strategy is selected and implemented, an effective method of evaluating its efficacy is through modelling. To illustrate the usefulness of models in evaluating control strategies, the authors describe several examples in detail, including three examples of classification and regression tree modelling to evaluate and improve the early detection of disease: West Nile fever in equids, bovine spongiform encephalopathy (BSE) and multifactorial diseases, such as colony collapse disorder (CCD) in the United States. Also examined are regression modelling to evaluate skin test practices and the efficacy of an awareness campaign for bovine tuberculosis (bTB); mechanistic modelling to monitor the progress of a control strategy for BSE; and statistical nationwide modelling to analyse the spatio-temporal dynamics of bTB and search for potential risk factors that could be used to target surveillance measures more effectively. In the accurate application of models, an interdisciplinary rather than a multidisciplinary approach is required, with the fewest assumptions possible.
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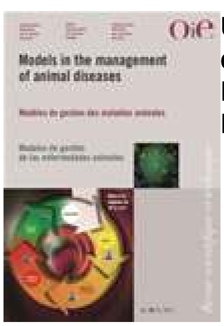


**Using simplified models to communicate the importance of prevention, detection and preparedness before a disease outbreak**
McNab B, Dubé C, Alves D
Rev Sci Tech. 2011 Aug; 30 (2): 591-602

Frontline farm workers and veterinary-policy-makers are arguably in the best positions to influence prevention, detection, and preparedness-for-control of farm animal diseases. It is important that such individuals make biologically sound decisions concerning the daily management and regulation of the health of animals. Such decisions should be based on a good understanding of key principles of disease spread and control. This paper summarises these principles, as described in previous publications, into simple models. These models may be used to communicate concepts to readers who may not have time to study more complex models. These models illustrate the relationship between the development of new disease cases (from existing cases, i.e., the reproductive ratio R) and (i) the duration of the period during which existing cases are available as infectious, (ii) contact rates, (iii) transmission rates and (iv) susceptibility. Understanding these concepts through models has great utility, facilitating better decisions for disease prevention, detection and preparedness-for-control, before an outbreak becomes unmanageable. These basic concepts apply to all animal species, including humans.
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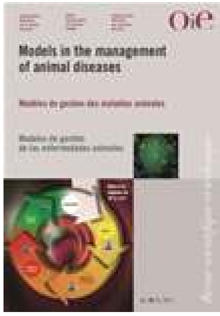

**The world organisation for animal health and epidemiological modelling: background and objectives**
Willeberg P, Grubbe T, Weber S, Forde-Folle K, Dubé C
Rev Sci Tech. 2011 Aug; 30 (2): 391-405

The papers in this issue of the Scientific and Technical Review (the Review) examine uses of modelling as a tool to supportthe formulation of disease control policy and applications of models for various aspects of animal disease management. Different issues in model development and several types of models are described. The experience with modelling during the 2001 foot and mouth disease outbreak in the United Kingdom underlines how models might be appropriately applied by decision-makers when preparing for and dealing with animal health emergencies. This paper outlines the involvement of the World Organisation for Animal Health (OIE) in epidemiological modelling since 2005, with emphasis on the outcome of the 2007 questionnaire survey of model usage among Member Countries, the subsequent OIE General Session resolution and the 2008 epidemiological modelling workshop at the Centers for Epidemiology and Animal Health in the United States. Many of the workshop presentations were developed into the papers that are presented in this issue of the Review.
**Text in English**
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## Epidemiología Participativa / Participatory Epidemiology

**Epidemiología participativa – Métodos para la recolección de acciones y datos orientados a la inteligencia epidemiológica**
FAO (Manual FAO de Producción y Sanidad Animal, No. 10)
2011

*Epidemiología Participativa* es un campo emergente basado en el uso de técnicas participativas para la recolección de la epidemiología cualitativa la cual esta contenida inteligentemente dentro de las observaciones que las comunidades hacen sobre las enfermedades como es «el conocimiento veterinario existente» y «las historias tradicionales» comunicadas oralmente.
Este documento describe el papel evolutivo de las técnicas de diagnóstico participativo y del diagnostico rápido para epidemiología veterinaria con particular referencia a la vigilância de enfermedades. Igualmente, los usos de las técnicas participativas y de investigación cualitativa son evaluados con relación a la investigación cuantitativa convencional.
El documento, también está orientado en el uso de métodos de encuestas cualitativas para asegurar que el análisis sea riguroso y que los resultados sean fidedignos.
Igualmente, se presentan en el documento una serie de herramientas reconocidas de DRP (Diagnóstico Rural Participativo) que vienen siendo aplicadas en salud animal y otros instrumentos que pueden merecer su aplicación.
Finalmente, es evaluada la dirección futura que la investigación cualitativa participativa tendrá en

relación con los desafíos que enfrentará la epidemiología veterinaria de hoy.
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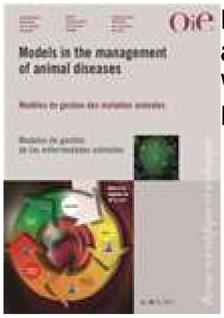
http://www.fao.org/docrep/014/i2363s/i2363s00.pdf

## Fauna Salvaje – Análisis Espacial / Wildlife – Spatial Analysis




**Disease spread models in wild and feral animal populations: application of artificial life models**
Ward MP, Laffan SW, Highfield LD
Rev Sci Tech. 2011 Aug; 30 (2): 437-46

The role that wild and feral animal populations might play in the incursion and spread of important transboundary animal diseases, such as foot and mouth disease (FMD), has received less attention than is warranted by the potential impacts. An artificial life model (Sirca) has been used to investigate this issue in studies based on spatially referenced data sets from southern Texas. An incursion of FMD in which either feral pig or deer populations were infected could result in between 698 and 1557 infected cattle and affect an area of between 166 km2 and 455 km2 after a 100-day period. Although outbreak size in deer populations can be predicted bythe size of the local deer population initially infected, the resulting outbreaks in feral pig populations are less predictable. Also, in the case of deer, the size of potential outbreaks might depend on the season when the incursion occurs. The impact of various mitigation strategies on disease spread has also been investigated. The approach used in the studies reviewed here explicitly incorporates the spatial distribution and relationships between animal populations, providing a new framework to explore potential impacts, costs, and control strategies.
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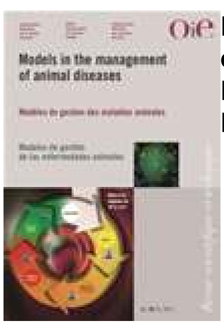
## Fiebre Aftosa / Foot and Mouth Disease




**Destructive tension: mathematics versus experience--the progress and control of the 2001 foot and mouth disease epidemic in Great Britain**
Mansley LM, Donaldson AI, Thrusfield MV, Honhold N
Rev Sci Tech. 2011 Aug; 30 (2): 483-9

The 2001 foot and mouth disease epidemic in Great Britain was characterised by control using both traditional and novel methods, some resulting from conclusions of mathematical models. Seven days before the implementation of the novel controversial automatic pre-emptive culling of all susceptible livestock on premises adjacent to infected premises (the 'contiguous cull'), the spread of infection had already been controlled by a combination of the traditional stamping out policy with a national movement ban on livestock. A second controversial novel policy requiring the slaughter of sheep within 3 km of premises on which disease had been confirmed (the 3-km cull) also commenced after the peak of infection spread, was untargeted and took several weeks to complete; serosurveillance of culled sheep detected infection in only one flock, suggesting that cryptic infection of sheep was not propagating the epidemic. Extensive post-epidemic serological surveillance of sheep found only a small number of seropositive animals in a very few flocks, suggesting that foot and mouth disease may selflimit in extensive sheep populations. The epidemic was finally brought to an end following the introduction of enhanced agricultural movement restrictions and biosecurity measures. A welfare culling scheme of unaffected animals was required to support the prolonged national livestock movement ban. The models that supported the contiguous culling policy were severely flawed, being based on data from dissimilar epidemics; used inaccurate background population data, and contained highly improbable biological assumptions about the temporal and quantitative parameters of infection and virus emission in infected herds and flocks.

**Text in English**

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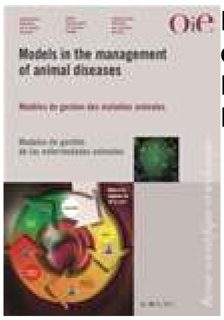



**Estimation of foot and mouth disease transmission parameters, using outbreak data and transmission experiments**

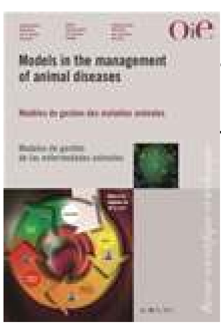
Hagenaars TJ, Dekker A, de Jong MC, Eblé PL

Rev Sci Tech. 2011 Aug; 30 (2):467-77

Mathematical models for the spread of foot and mouth disease (FMD) have been developed and used for a number of purposes in the recent literature. One important purpose is predicting the effect of strategies to combat between-farm epidemic spread, in support of decision-making on epidemic control. The authors briefly review the various modelling approaches, discussing the parameters used and how estimates may be obtained for these parameters. They emphasise that, in addition to the estimation of FMD transmission parameters, the choice of model structure (including the number and type of parameters used) is also crucial. Two gaps in the knowledge of FMD transmission, related to model construction and parameter quantification, are identified: transmission between different species and the way in which vaccination affects such transmission, and route-specific FMD transmission properties. In particular, the authors pay attention to the role that small-scale transmission experiments can play in bridging these gaps.

**Text in English**

http://web.oie.int/boutique/extrait/09hagenaars467481.pdf




**Foot and mouth disease model verification and 'relative validation' through a formal model comparison**

Sanson RL, Harvey N, Garner MG, Stevenson MA, Davies TM, Hazelton ML, O'Connor J, Dubé C, Forde-Folle KN, Owen K

Rev Sci Tech. 2011 Aug; 30 (2): 527-40

Researchers from Australia, New Zealand, Canada and the United States collaborated to validate their foot and mouth disease models--AusSpread, InterSpread Plus and the North American Animal Disease Spread Model--in an effort to build confidence in their use as decision-support tools. The final stage of this project involved using the three models to simulate a number of disease outbreak scenarios, with data from the Republic of Ireland. The scenarios included an uncontrolled epidemic, and epidemics managed by combinations of stamping out and vaccination. The predicted numbers of infected premises, the duration of each epidemic, and the size of predicted outbreak areas were compared. Relative within-model between-scenario changes resulting from different control strategies or resource constraints in different scenarios were quantified and compared. Although there were differences between the models in absolute outcomes, between-scenario comparisons within each model were

similar. In all three models, early use of ring vaccination resulted in the largest drop in number of infected premises compared with the standard stamping-out regimen. This consistency implies that the assumptions made by each of the three modelling teams were appropriate, which in turn serves to increase end-user confidence in predictions made by these models.
**Text in English**
http://web.oie.int/boutique/extrait/13sanson527540.pdf


**Foot-and-mouth disease virus particles inactivated with binary ethylenimine are efficiently internalized into cultured cells: Internalization of BEI-inactivated FMDV**
Martín-Acebes A, Vázquez-Calvo A, González-Magaldi M, Sobrino F
Vaccine 2011 Oct

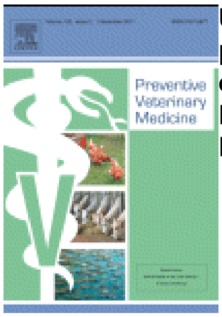
Conventional foot-and-mouth disease (FMD) vaccines are produced from virus grown in cell culture that is chemically inactivated by using binary ethylenimide (BEI). Here, we show that BEI treatment preserves both the architecture of FMDV particles, as inactivated viral particles showed by electron microscopy characteristics similar to those of infectious virions, as well as the general features of infectious virus internalization. Binding of inactivated particles to BHK-21 cells was blocked by preincubation with either a FMDV-specific monoclonal antibody or a synthetic peptide spanning the integrin-binding viral motif Arg-Gly-Asp (RGD). In addition, these particles were internalized into cultured cells through endocytosis, being directed to early endosomes, as indicated by their colocalization with the marker protein Rab5. When purified BEI-inactivated virions were labelled and their interaction with live cultured cells analyzed by time-lapse fluorescence microscopy, a major subpopulation of virus particles, about 80%, was shown to undergo internalization into a static endosome population, insensitive to the microtubule depolymerization exerted by nocodazole, while the remaining subpopulation (about 20%) was dynamic and sensitive to this drug. Thus, BEI-inactivated particles provide an interesting tool to study early steps in FMDV–cell interactions enabling a distinction between FMDV internalization and productive infection. Possible implications for FMDV immune response elicited following vaccine administration are discussed.
**Text in English (article in press)**


**A sensitivity analysis of the New Zealand standard model of foot and mouth disease**
Owen K, Stevenson MA, Sanson RL
Rev Sci Tech. 2011 Aug; 30 (2): 513-26

Disease simulation models can be a valuable tool for planning a response to exotic disease incursions, as they provide a fast, low-cost mechanism for identifying the likely outcomes of a range of outbreak scenarios and disease control strategies. To use these tools effectively and with confidence, decision-makers must understand the simplifications and framing assumptions that underlie a model's structure. Sensitivity analysis, the analytical process of identifying which input variables are the key drivers of the model's output, is a crucial process in developing this understanding. This paper describes the application of a sampling-based sensitivity analysis to the New Zealand standard model (NZSM). This model is a parameter set developed for the InterSpread Plus model platform to allow the exploration of different outbreak scenarios for an epidemic of foot and mouth disease in New Zealand. Based on 200 iterations of the NZSM, run for a simulation period of 60 days, settings related to farm-to-saleyard movements and the detection of disease during the active surveillance phase of the epidemic had the greatest influence on the predicted number of infected premises. A small number of counter-intuitive findings indicated areas of model design, implementation and/or parameterisation that should be investigated further. A potentially useful result from this work would be information to aid the grouping or elimination of non-influential model settings. This would go some way towards reducing the overall complexity of the NZSM, while still allowing it to remain fit for purpose.

**Text in English**

http://web.oie.int/boutique/extrait/12owen513526.pdf




**Utilizing qualitative methods in survey design: examining Texas cattle producers' intent to participate in foot-and-mouth disease detection and control**

Delgado AH, Norby B, Dean WR, McIntosh WA, Scott HM.

Prev Vet Med. 2011 Oct

The effective control of an outbreak of a highly contagious disease such as foot-and-mouth disease (FMD) in the United States will require a strong partnership between the animal agriculture industry and the government. However, because of the diverse number of economic, social, and psychological influences affecting livestock producers, their complete cooperation during an outbreak may not be assured. We conducted interviews with 40 individuals involved in the Texas cattle industry in order to identify specific behaviors where producer participation or compliance may be reduced. Through qualitative analysis of these interviews, we identified specific factors which the participants suggested would influence producer behavior in regard to FMD detection and control. Using the Theory of Planned Behavior (TPB) as an initial guide, we developed an expanded theoretical framework in order to allow for the development of a questionnaire and further evaluation of the relative importance of the relationships indicated in the framework. A 2-day stakeholder workshop was used to develop and critique the final survey instruments. The behaviors which we identified where producer compliance may be reduced included requesting veterinary examination of cattle with clinical signs of FMD either before or during an outbreak of FMD, gathering and holding cattle at the date and time requested by veterinary authorities, and maintaining cattle in their current location during an outbreak of FMD. In addition, we identified additional factors which may influence producers' behavior including risk perception, trust in other producers and regulatory agencies, and moral norms. The theoretical frameworks presented in this paper can be used during an outbreak to assess barriers to and social pressures for producer compliance, prioritize the results in terms of their effects on behavior, and improve and better target risk communication strategies.

**Text in English**

## Fiebre Amarilla / Yellow Fever

**Evolução histórica da vigilância epidemiológica e do controle da febre amarela no Brasil [Historical development and evolution of epidemiological surveillance and control of yellow fever in Brazil]**

Costa ZGA, Romano APM, Elkhoury ANM Flannery B

Rev Pan-Amaz Saude 2011; 2 (1): 11-26

In the past, yellow fever was a major scourge for the Brazilian population, one of the most dramatic public health problems in the country. Brazilian government has invested and achieved a major technical and scientific development, which finally led to the eradication of the urban transmission of the disease in Brazil, in 1 942, and influenced the campaign to eliminate *Aedes aegypti* in the Americas, in 1 958. The eradication of *sylvaticyellow* fever is impossible because it is a zoonosis of wild animals and *Aedes aegypti* has become widely spread in Brazil since the discontinuation of the continental elimination program; therefore its re-emergence in urban areas is a current threat. Although advances in medical sciences have not impacted on the disease's therapeutics in a specific manner, the development of the yellow fever vaccine has allowed its control, and has reduced the transmission levels of its sylvatic type to humans. This reduction and the combat against its urban vector have prevented the circulation of this virus in urban human populations in the Americas. This article casts a glance at the different ways this important public health problem has been confronted since its introduction to the Brazilian territory. It also covers the technical and scientific bases that underlie the actions at different moments of the past, the current status and the prospects for its control. Finally, it aims to analyze the evolution of the surveillance network of yellow fever in Brazil.

**Text in Portuguese**

http://scielo.iec.pa.gov.br/pdf/rpas/v2n1/v2n1a02.pdf

## Infecciones Macroparasitarias – Modelos Matemáticos / Macroparasitic Infections - Mathematical Models


**Models of macroparasitic infections in domestic ruminants: a conceptual review and critique**

Smith G

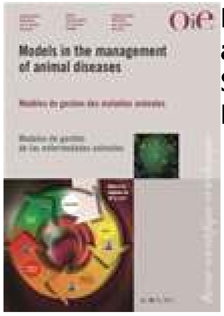
Rev Sci Tech. 2011 Aug; 30 (2): 447-56

A mathematical model is just a means of representing and manipulating something that would not otherwise be accessible. Decision theorists argue that a right decision is one that makes the best use of the available information and using mathematical models of infectious and parasitic disease can help make sure the decision-makers do just that. Seen in this light, models are simply aids to thought--and thus, by definition, good models are useful. This paper deals with the history of mathematical models of parasitic infections of domestic ruminants. It is argued that the early simple forecasting models were very successful, and, although the more complicated models that were constructed to improve the resolution of the forecasts were mostly failures, the experience gained generated a slew of useful, robust models that are still valuable decision-making tools.

**Text in English**

http://web.oie.int/boutique/extrait/07smith447456.pdf

## Influenza Aviar / Avian Influenza




**Epidemiological models to assist the management of highly pathogenic avian influenza**
Stegeman JA, Bouma A, de Jong MC
Rev Sci Tech. 2011 Aug; 30 (2): 571-9

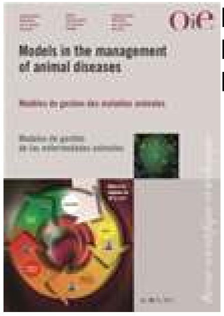
In recent decades, epidemiological models have been used more and more frequently as a tool for the design of programmes for the management of infectious diseases such as highly pathogenic avian influenza. Predictive models are used to simulate the effects of various control measures on the spread of the infection; analytical models are used to analyse data from outbreaks and experiments. A key parameter in these models is the reproduction ratio, which indicates to what degree the virus can be transmitted in the population. Parameters obtained from real data using the analytical models can be used subsequently in predictive models to evaluate control strategies or surveillance programmes. Examples of the use of these models are described in the current paper.
**Text in English**
http://web.oie.int/boutique/extrait/17stegeman571579.pdf

## Leishmaniasis


**Descriptive study of American tegumentary leishmaniasis in the urban area of the Municipality of Governador Valadares, Minas Gerais State, Brazil**
Miranda TM, Malaquias LCC, Escalda PMF, Ramalho KC, Coura-Vital W, Silva AR, Corrêa-Oliveira R, Reis AB
Rev Pan-Amaz Saúde 2011; 2 (1): 27-35

To understand the emergence and re-emergence pattern of American tegumentary leishmaniasis (ATL), the clinical and epidemiological profiles and the spatial distribution of the disease were evaluated between 2001 and 2006 in an endemic area located in the Rio Doce valley in the north-eastern part of the Minas Gerais State, Brazil. The number of reported cases increased from six in the first year to 111 in the last year during this period. Disease cases predominated in the urban area (75.9%) and affected males and females equally in all age groups. The transmission of ATL occurred within dwellings and the surrounding areas, with the largest number of reported cases originating from poor areas, particularly those located on the margins of the Rio Doce lacking suitable sanitary infrastructure. Diagnosis was based on clinical criteria and the Montenegro skin test, with most patients (93.8%) exhibiting the cutaneous form of ATL. First-line treatment involved administration of pentavalent antimonial drugs (99.1%), and these provided a cure for > 75% of patients. The prevalence of ATL varied between 11.38 and 15.99 cases per 100,000 inhabitants, which is high in comparison with the national average. Urgent measures, including improved means of diagnosis at the local health units, education of schoolchildren and motivation of the general population, are required to decrease transmission and control the disease.
**Text in English**
http://scielo.iec.pa.gov.br/pdf/rpas/v2n1/v2n1a03.pdf

## Modelo de Propagación de Enfermedades – Léxico / Disease Spread Model – Lexicon




**Lexicon of disease spread modelling terms**
Patyk K, Caraguel C, Kristensen C, Forde-folle K
Rev Sci Tech. 2011 Aug; 30 (2): 547-54

Over the past decade there has been a notable increase in the magnitude and variety of modelling work in the realm of animal health. Similarly, there has been an increase in the extent to which modelling is used as a component in the development of animal health policy. The increased dependency on modelling creates a need to enhance understanding and linkages between policy-makers (those that pose the policy or scientific questions, commission modelling work and use model outputs in the development of policy), intermediaries (those that are responsible for working with modellers and communicating model results to policy-makers), and modellers. Development of a lexicon of disease spread modelling terms can help support clear communication and collaboration between all players.
**Text in English**
http://web.oie.int/boutique/extrait/15patyk547554.pdf

## Peste Bovina / Rinderpest


**Rinderpest: the end of cattle plague**
Roeder PL
Prev Vet Med. 2011 Nov; 102 (2): 98-106

This paper describes the demise of rinderpest, focussing on the 20th Century and especially the period of the Global Rinderpest Eradication Programme, before proceeding to describe the process of accreditation of rinderpest freedom which is now virtually complete.
**Text in English**

## Transmisión de Enfermedades - Modelo de Dispersión Atmosférica / Disease Transmission - Atmospheric Dispersion Model


**Atmospheric dispersion models and their use in the assessment of disease transmission**
Gloster J, Burgin L, Jones A, Sanson R
Rev Sci Tech. 2011 Aug ;30 (2):4 57-65

Atmospheric dispersion models can be used to assess the likely airborne spread of both plant and animal diseases. These models, often initially developed for other purposes, can be adapted and used to study past outbreaks of disease as well as operationally to provide advice to those responsible for containing or eradicating disease in the event of a specific emergency. The models can be run over short periods of time where emissions and infection periods can be accurately determined or in situations requiring a statistical approach perhaps covering many weeks or even months. They can also be embedded within other simulation models, i.e. models which seekto represent a wider variety of disease transmission mechanisms. Whilst atmospheric dispersion models have been used successfully in a number of instances, they have the potential for wider application in the future. To achieve maximum success in these ventures, close collaboration between the modellers and scientists from the appropriate range of disciplines is required.

**Text in English**

http://web.oie.int/boutique/extrait/08gloster457465.pdf

## Tuberculosis Bovina / Bovine Tuberculosis


**Modelling the feasibility of bovine tuberculosis eradication in Argentina**

Perez AM, Ward MP, Ritacco V

Rev Sci Tech. 2011 Aug; 30 (2): 635-43

The ability of countries to control and eradicate bovine tuberculosis (TB) has been jeopardised by various epidemiological and ecological features of the disease. The authors have used epidemiological modelling to develop an analytical framework to assess the likely success of a national TB eradication programme in Argentina. Study results suggest that the current control programme is financially feasible in the long term. However, considering that the costs of the TB eradication programme in Argentina are entirely borne by the producer, the initial investment required and the long-term horizon needed to gain revenue may prevent producers from endorsing the programme. Regionalised programmes that allow differential control strategies to be implemented in specific regions may increase the likelihood of success. This methodological approach could be extended to design and evaluate control and eradication programmes for TB and other infectious diseases in other regions of the world.

**Text in English**

http://web.oie.int/boutique/extrait/23perez635643.pdf

## Vigilancia en Salud Animal – Evaluación Económica / Surveillance  Animal Health - Economic Evaluation

BMC Health Services Research

**Conceptualizing the technical relationship of animal disease surveillance to intervention and mitigation as a basis for economic analysis**

Hasler B, Howe KS, Stark KD

BMC Health Serv Res. 2011 Sep; 11 (1): 225

BACKGROUND: Surveillance and intervention are resource-using activities of strategies to mitigate the unwanted effects of disease. Resources are scarce, and allocating them to disease mitigation instead of

other uses necessarily involves the loss of alternative sources of benefit to people. For society to obtain the maximum benefits from using resources, the gains from disease mitigation must be compared to the resource costs, guiding decisions made with the objective of achieving the optimal net outcome.
DISCUSSION: Economics provides criteria to guide decisions aimed at optimising the net benefits from the use of scarce resources. Assessing the benefits of disease mitigation is no exception. However, the technical complexity of mitigation means that economic evaluation is not straightforward because of the technical relationship of surveillance to intervention. We argue that analysis of the magnitudes and distribution of benefits and costs for any given strategy, and hence the outcome in net terms, requires that mitigation is considered in three conceptually distinct stages. In Stage I, 'sustainment', the mitigation objective is to sustain a free or acceptable status by preventing an increase of a pathogen or eliminating it when it occurs. The role of surveillance is to document that the pathogen remains below a defined threshold, giving early warning of an increase in incidence or other significant changes in risk, and enabling early response. If a pathogen is not contained, the situation needs to be assessed as Stage II, 'investigation'. Here, surveillance obtains critical epidemiological information to decide on the appropriate intervention strategy to reduce or eradicate a disease in Stage III, 'implementation'. Stage III surveillance informs the choice, timing, and scale of interventions and documents the progress of interventions directed at prevalence reduction in the population.
SUMMARY: This article originates from a research project to develop a conceptual framework and practical tool for the economic evaluation of surveillance. Exploring the technical relationship between mitigation as a source of economic value and surveillance and intervention as sources of economic cost is crucial. A framework linking the key technical relationships is proposed. Three conceptually distinct stages of mitigation are identified. Avian influenza, salmonella, and foot and mouth disease are presented to illustrate the framework.
**Text in English**
http://www.biomedcentral.com/content/pdf/1472-6963-11-225.pdf

## Eventos / Events

**2nd World Conference on Biological Invasions and Ecosystem Functioning (BIOLIEF 2011)**
21-24 **November** 2011
Mar del Plata, Argentina
http://www.grieta.org.ar/biolief/

## Noticias / News

Reflexiones
La salud de la gente, la gente de salud

Este proyecto "La salud de la gente, la gente de salud", compuesto por una serie de entrevistas y documentos, tiene como objetivo rescatar y prestigiar el valor agregado a la salud y el bienestar de las poblaciones de la Región que cada funcionario ha aportado a lo largo de su carrera en la Salud Pública y en la OPS/OMS.
http://new.paho.org/blogs/reflexiones/

Reflections
The health of the people, the people of health

This project, "The Health of the People, the People of Health," made up of a series of interviews and documents, has as its purpose to rescue and to honor the contribution of every staff member to the health and well-being of the people of the Region throughout their career in Public Health and at PAHO/WHO.
http://new.paho.org/blogs/reflexiones/index.php?lang=en

Organización Panamericana de la Salud
Oficina Regional de la Organización Mundial de la Salud
Salud Pública Veterinaria
Centro Panamericano de Fiebre Aftosa

Pan American Health Organization
Regional Office of the World Health Organization
Veterinary Public Health
Pan American Foot and Mouth Disease Center

**Centro de Documentación / Documentation Center (CEDOC)**
**Teléfono / Phone**: 55 21 3661-9045
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**http://bvs.panaftosa.org.br**
**http://bvs.panalimentos.org**

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apimente@panaftosa.ops-oms.org