UNIVERSITY OF LIVERPOOL | INSTITUTE OF INFECTION AND GLOBAL HEALTH

Socio-economic aspects of veterinary vaccine development

Camille Bellet and Jonathan Rushton
Institute of Infection and Global Health, University of Liverpool

European Veterinary Vaccinology Workshop - 21-22 May 2018

VETERINARY VACCINOLOGY NETWORK

SAPHIR
Strengthening Animal Production and Health through the Immune Response

PARAGONE

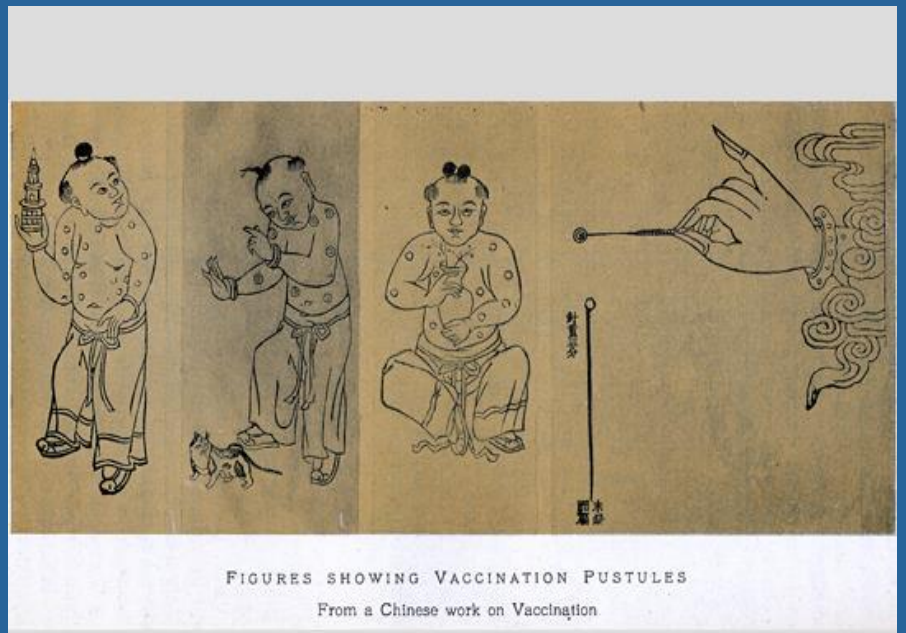
- Brief recall of vaccine history
- ‘Subjective and meaning-laden elements of technology development’[1] with some illustrations from the vaccine sector
- Role of sciences in influencing veterinary vaccine development
- Examining the social representations of ‘impact’ and ‘impact assessment’ in academic circles
- Implications for the future of vaccine research and animal health policy

[1]Jasanoff, N. 2002. New Modernities: Reimagining Science, Technology and Development. *Env. Values* 11: 253–76

Children receiving diphtheria immunization, New York City, 1920s
Source: Metropolitan Life Insurance Co.

Dog vaccination campaign, Kenya, 2017
Source: Anawafrica

Source: Royal Mummy Hall of the Museum of Egyptian Antiquities, Cairo, Egypt



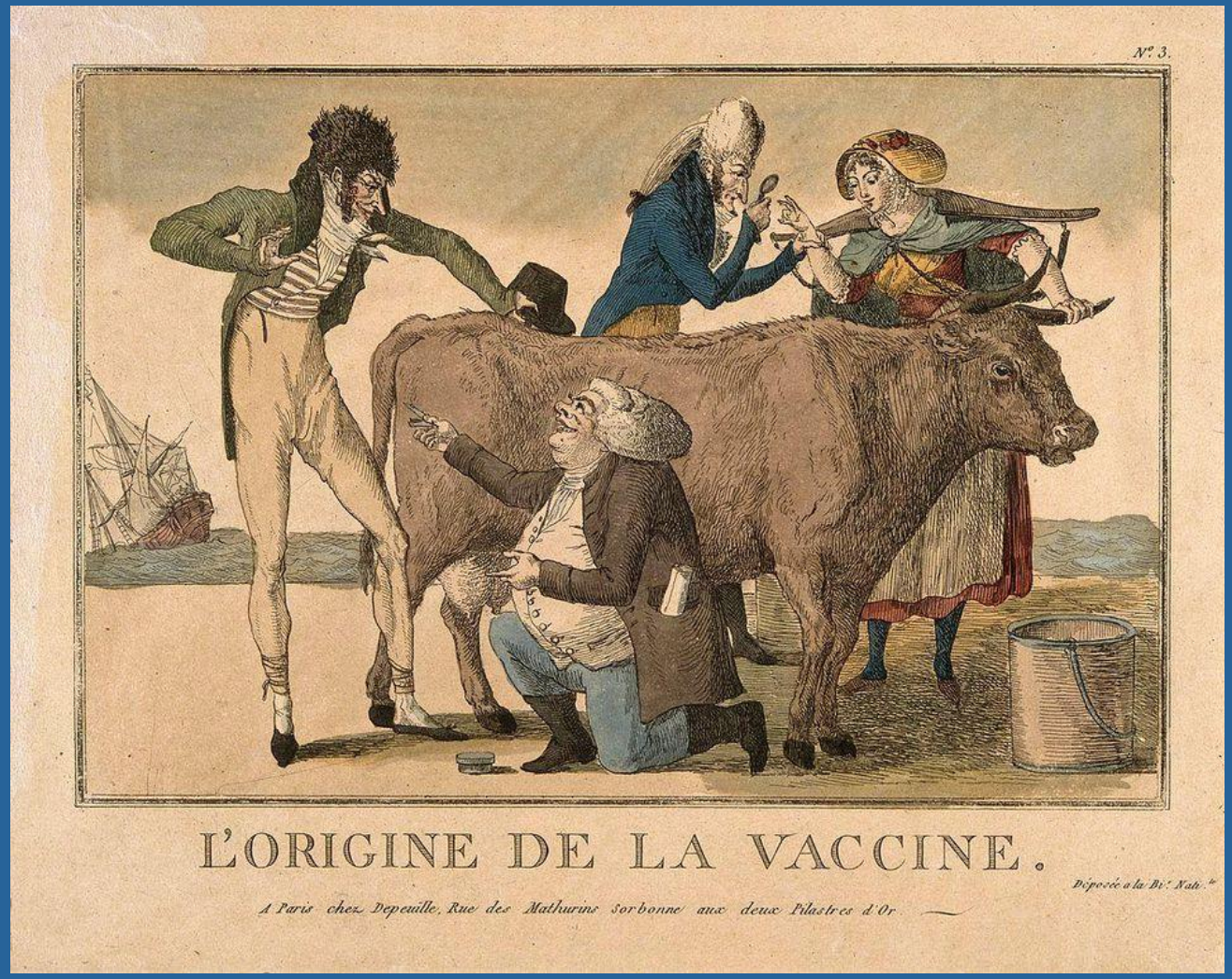
FIGURES SHOWING VACCINATION PUSTULES

From a Chinese work on Vaccination

Source: The Historical Medical Library of The College of Physicians of Philadelphia. The History of Inoculation and Vaccination for the Prevention and Treatment of Disease. Lecture Memoranda. A.M.A. Meeting, Minneapolis. Burroughs Wellcome and Co. London, 1913

Source: Lady Mary Wortley Montague (1689–1762). Photo courtesy of the National Library of Medicine.

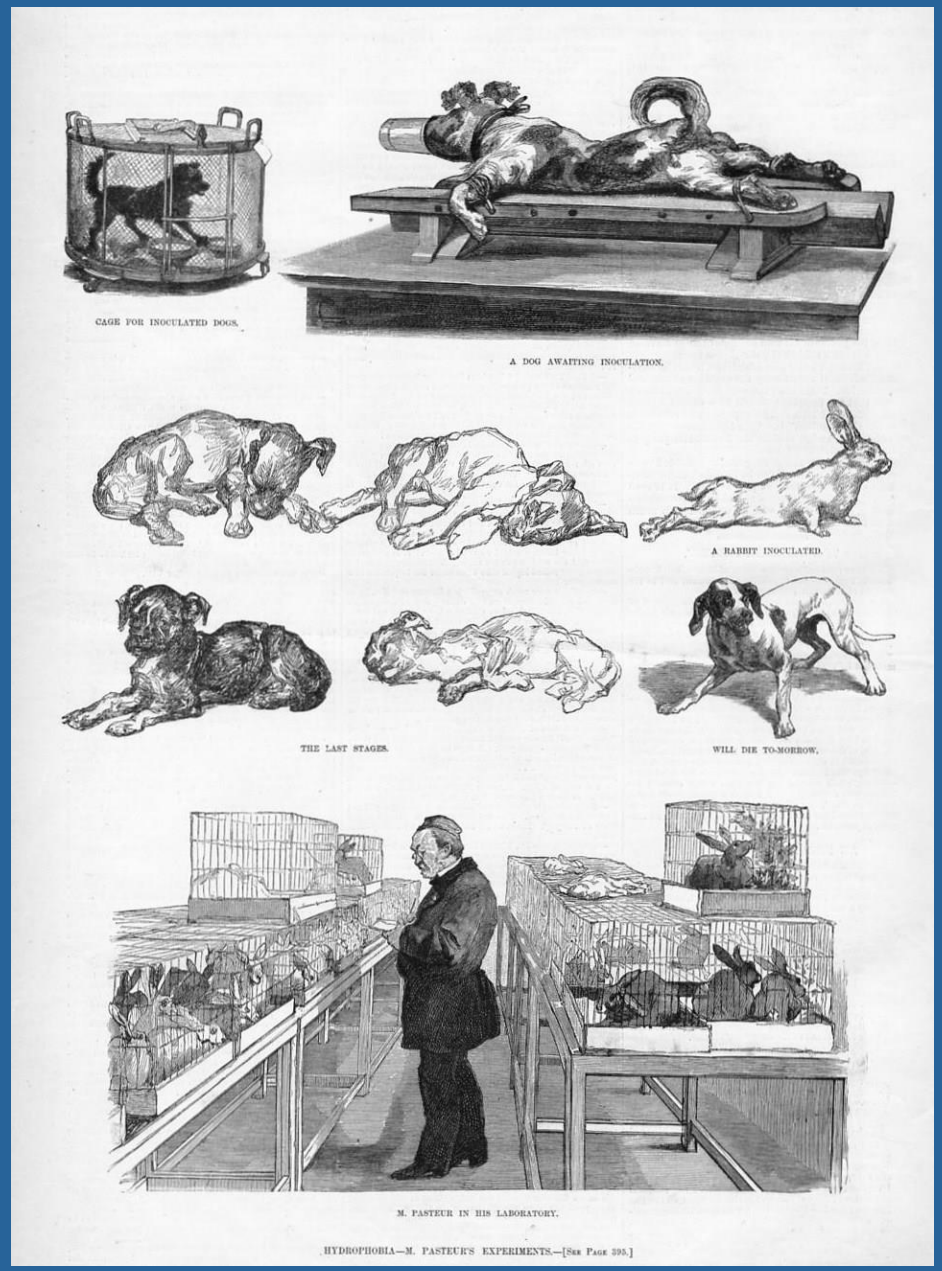
Source: Edward Jenner (1749–1823). Photo courtesy of the National Library of Medicine.



Source: Wellcome Images, a website operated by Wellcome Trust, a global charitable foundation based in the United Kingdom

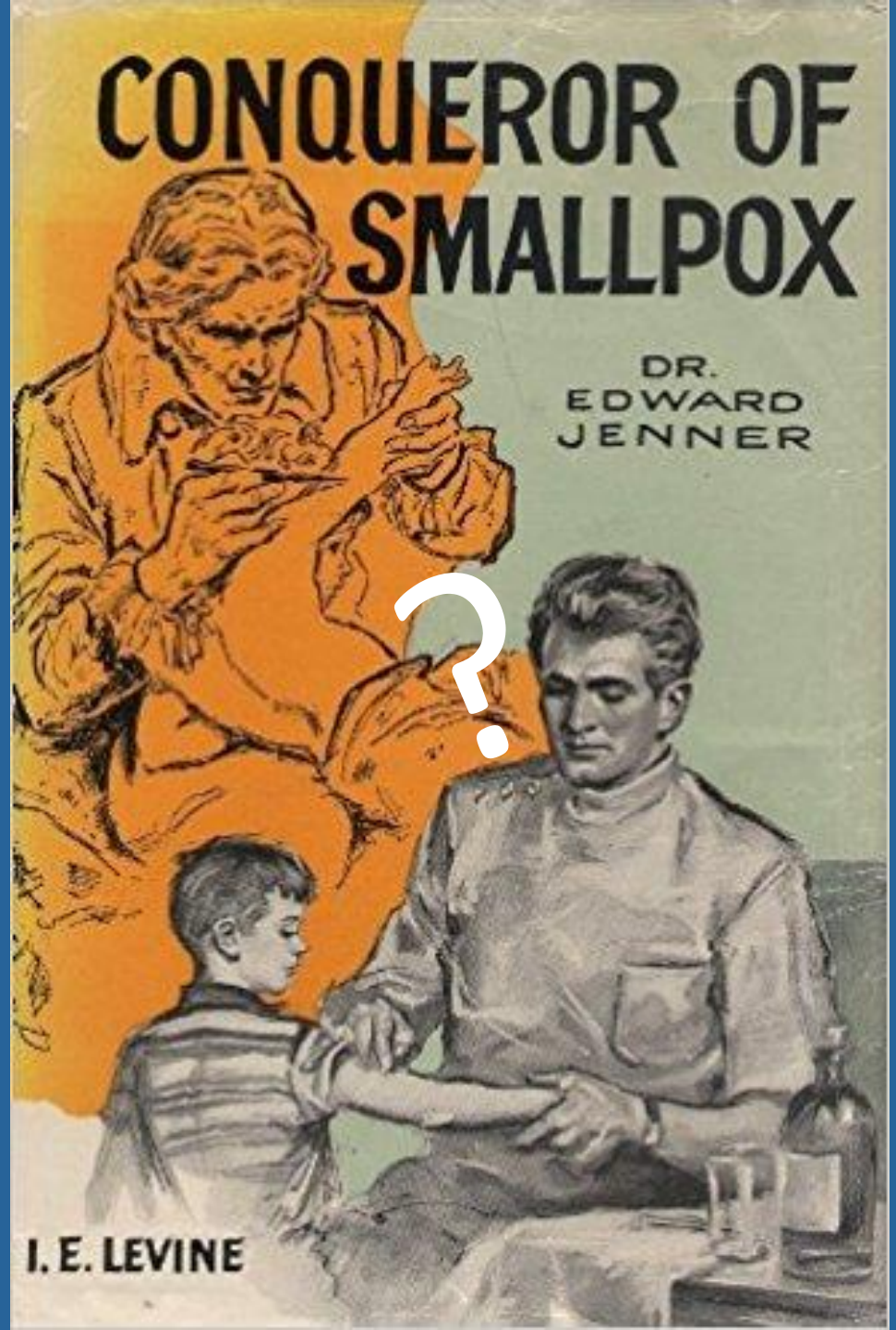
Jose Esparza

Vial containing the 1902 smallpox sample



Marek disease

Adapted from Lombard, M.L. 2007. A brief history of vaccines and vaccination. *OIE Rev. Sci. Tech.* 10.20506/rst.26.1.1724


CONQUEROR OF SMALLPOX
DR. EDWARD JENNER
?
I. E. LEVINE

‘Rinderpest: first animal disease eradicated in human history’

By FAO, 25 June 2011

A group of eminent persons attending the 1921 conference visits France’s National Veterinary School of Alfort (ENVA)

British veterinarian Dr. Walter Plowright (center) became the 1999 World Food Prize Laureate for his work developing a cattle-use rinderpest vaccine, which is credited with substantially helping eradicate the disease worldwide.

Source: BBSRC media

Dr Murchison (1830-1879), wrote to *The Times* (30 January 1866) saying that: ‘the analogies between smallpox and rinderpest were so obvious that it was logical to try to vaccinate cattle against rinderpest’

A Rinderpest outbreaks in the Netherlands in the 18th century - Source: Jacobus Eussen /Wikimedia Commons

A Rinderpest outbreak in South Africa in 1897. Source: de la imagen

The world was officially declared free from *rinderpest* in 2011 in the course of the 79th OIE General Session

Jasanoff, Sheila, "New Modernities: Reimagining Science, Technology and Development"

WORLD ORGANISATION FOR ANIMAL HEALTH

Protecting animals, preserving our future

1924-2011

The Odyssey of Rinderpest Eradication

MERCK
INVENTING FOR LIFE

VIROVET
LIVESTOCK SOLUTIONS

Gavi
The Vaccine Alliance

World Health Organization

SANOFI

Virbac

RESEAU CRISTAL
SANTE ANIMALE

OIE

FAO
FIAT PANIS

INRA
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MINISTÈRE
DE L'AGRICULTURE
DE L'AGROALIMENTAIRE
ET DE LA FORÊT

defra
Department for Environment
Food and Rural Affairs

The Centre for
Global Vaccine Research

THE
Pirbright
INSTITUTE

USDA

Ensemble pour une vaccination libre

NFU

THE WORLD BANK
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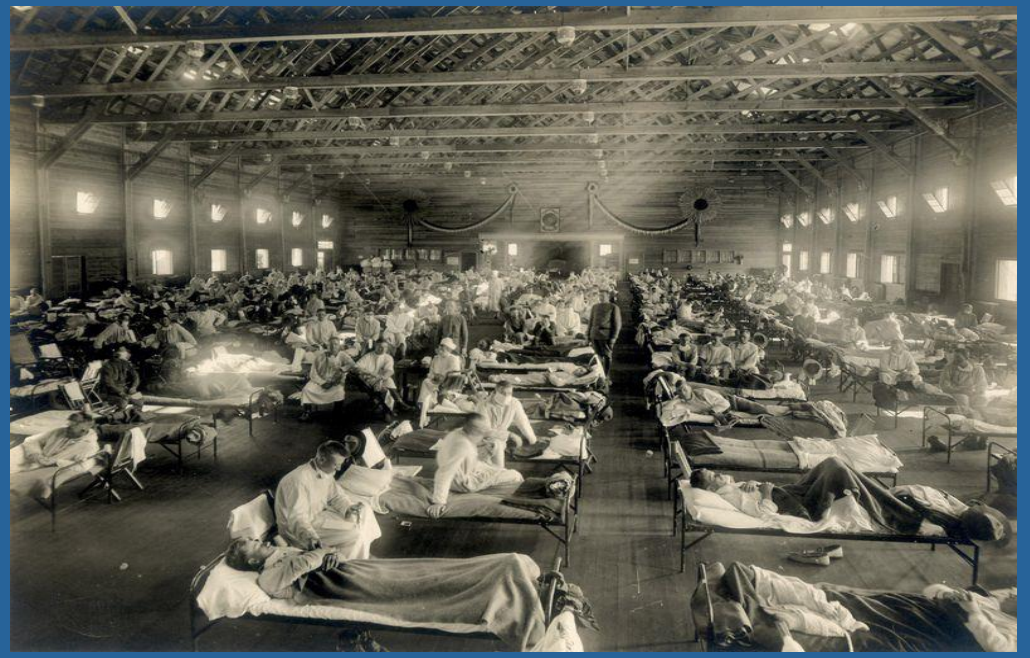
BILL & MELINDA
GATES foundation

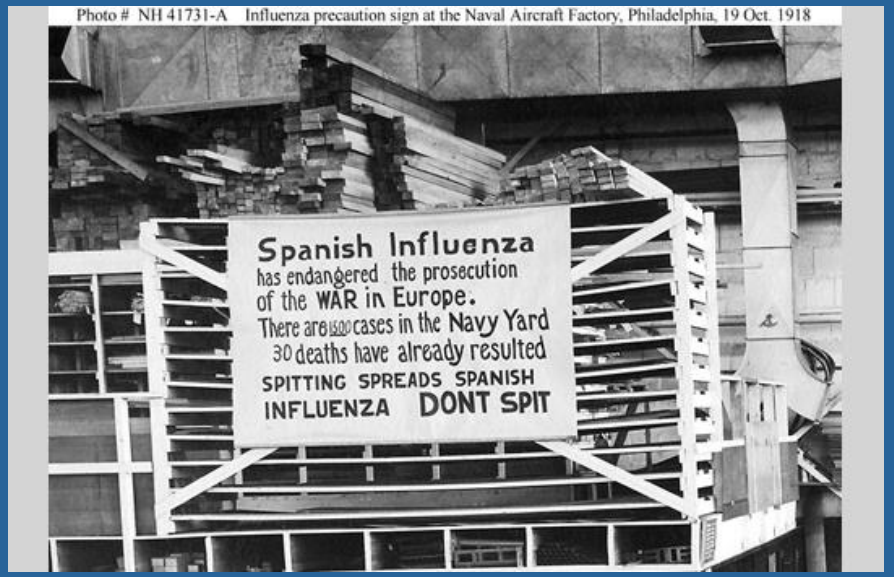
MapaBRASIL

National
Farmers
Union

President George Washington's decision to inoculate the Continental Army against smallpox very likely helped the American Colonies win the Revolutionary War (1779). Source: "The March to Valley Forge" by William B. T. Trego.



An emergency hospital at Camp Funston, Kansas, 1918. "Of the 12 men who slept in my squad room, 7 were ill at one time," a soldier recalled. (New Contributed Photographs Collection / otis historical Archives / National Museum of Health and Medicine)



Bourges - museum – WWI © Bertrand PHILIPPPE

Source: Sanofi Pasteur Canada

Source: JAVMA. WWI USA, 1917

Rabid dog in town, T.L. Busby, 1826

The meatpacking plant of Chicago's Union Stockyards was a sprawling facility that handled the slaughter, processing, packaging and distribution of cattle and swine. In operation by 1865, it was among the earliest U.S businesses to exemplify the industrial model. (Photo credit: John Vachon, 1941. Public domain)

The William Davies Company facilities in Toronto, Canada, circa 1920. This facility was then the second largest hog-packing plant in North America.

Church Street, Liverpool, 1880

Havelock street, Liverpool, 1960

This youngster was just one of millions forced to play among rubble and debris on a housing estate, Manchester, 1971 (Source: Dailymail)

‘The slum children who shocked Swinging Sixties Britain’ (1968-1972)

‘Cholera Epidemic Envelops Coastal Slums in West Africa’

By ADAM NOSSITER, The New-York Times AUG. 22, 2012

Source: Gavi/2018.

The shore of a quarter in Freetown, Sierra Leone, was littered with trash. Credit Holly Pickett

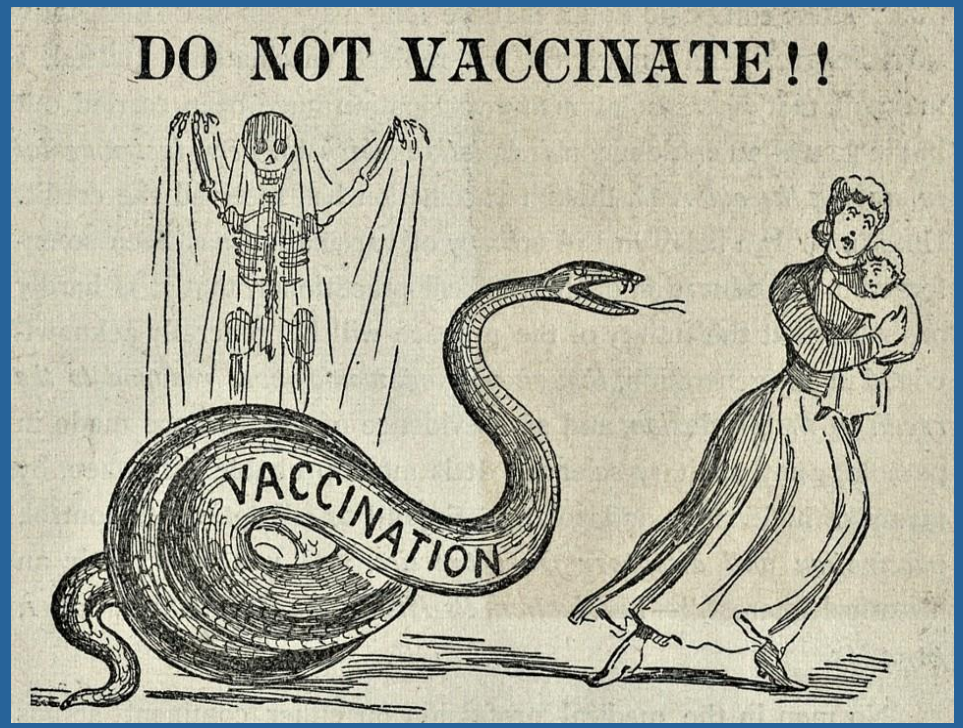
'Young male have increased risk of respiratory disease during transport'
By Amy Stewart, 2012

coccidiosis

Philip Clarke

BEWARE! THE VACCINE

From a French caricature of the XVIII century

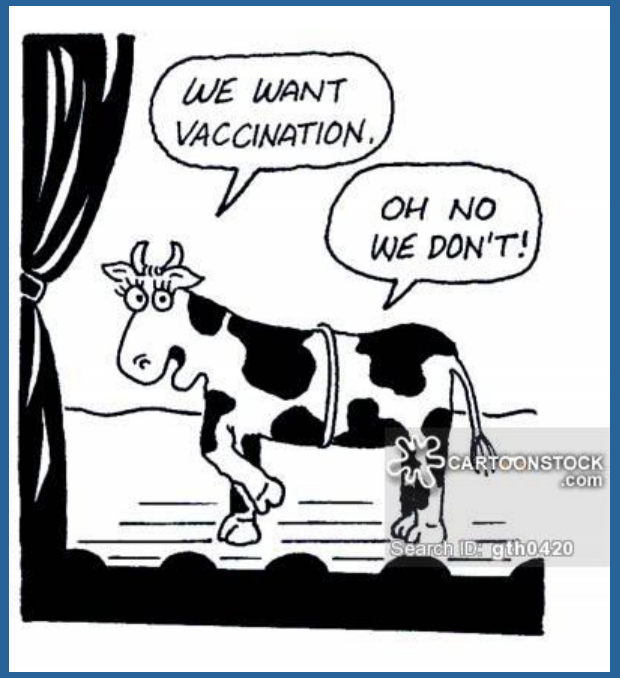


Courtesy of The Historical Medical Library of The College of Physicians of Philadelphia, 1894

Photo credit: Small World FS

Photo credit: Alpha/Flickr

Photo credit: Lindsay Perry



Cartoon, FMD, G. Thompson

Vaccinating cattle against bovine tuberculosis in France, 1921-1963: between the epistemic value of the animal model and an alternative to sanitary policies

Summary – *This paper focuses on the trajectory of the BCG vaccine used against bovine tuberculosis in France between 1921 and 1963. It shows how public health issues related to this disease are intimately linked with other issues, whether professional, industrial or of political economy. First, it analyses the way the Pasteur Institute, veterinarians and farmers got mobilized to transform the French legislation in order to gain more direct responsibilities in the control of bovine tuberculosis between 1930 and 1950. Second, it studies how farmers' appropriation of prophylactic techniques contributed to redefine the sanitary policy against this disease in a global context of agricultural modernization promoted by the post-war French government, whereas at the same time, the new research orientation of the Pasteur Institute led to the abandon of the veterinary vaccine.*

Keywords: *bovine tuberculosis, BCG vaccine, sanitary policy, veterinary professionnalization, expertise*

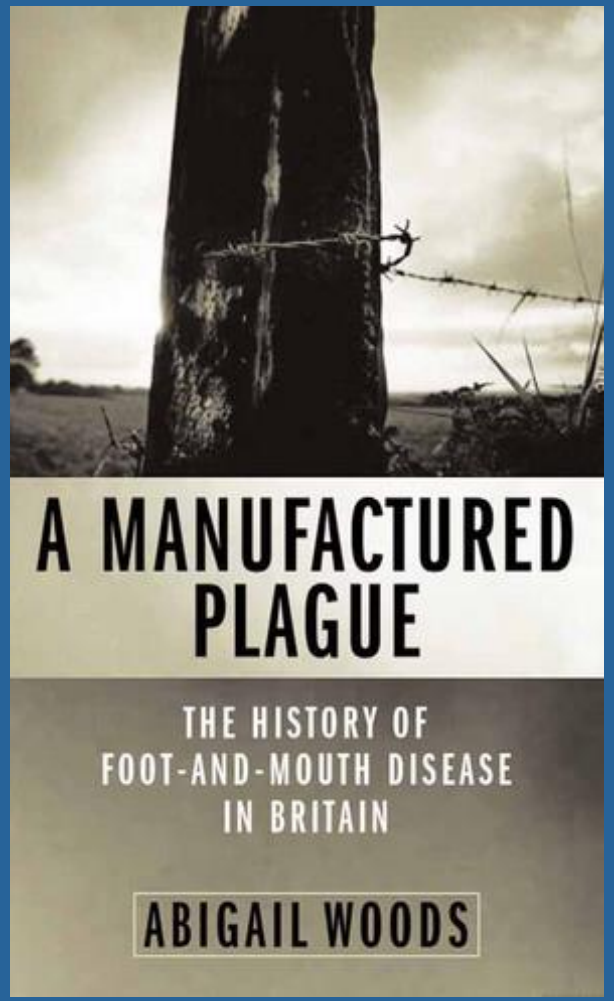
2010, Berdah. Rev. Et. Agric. Env. 91(4), 393-415

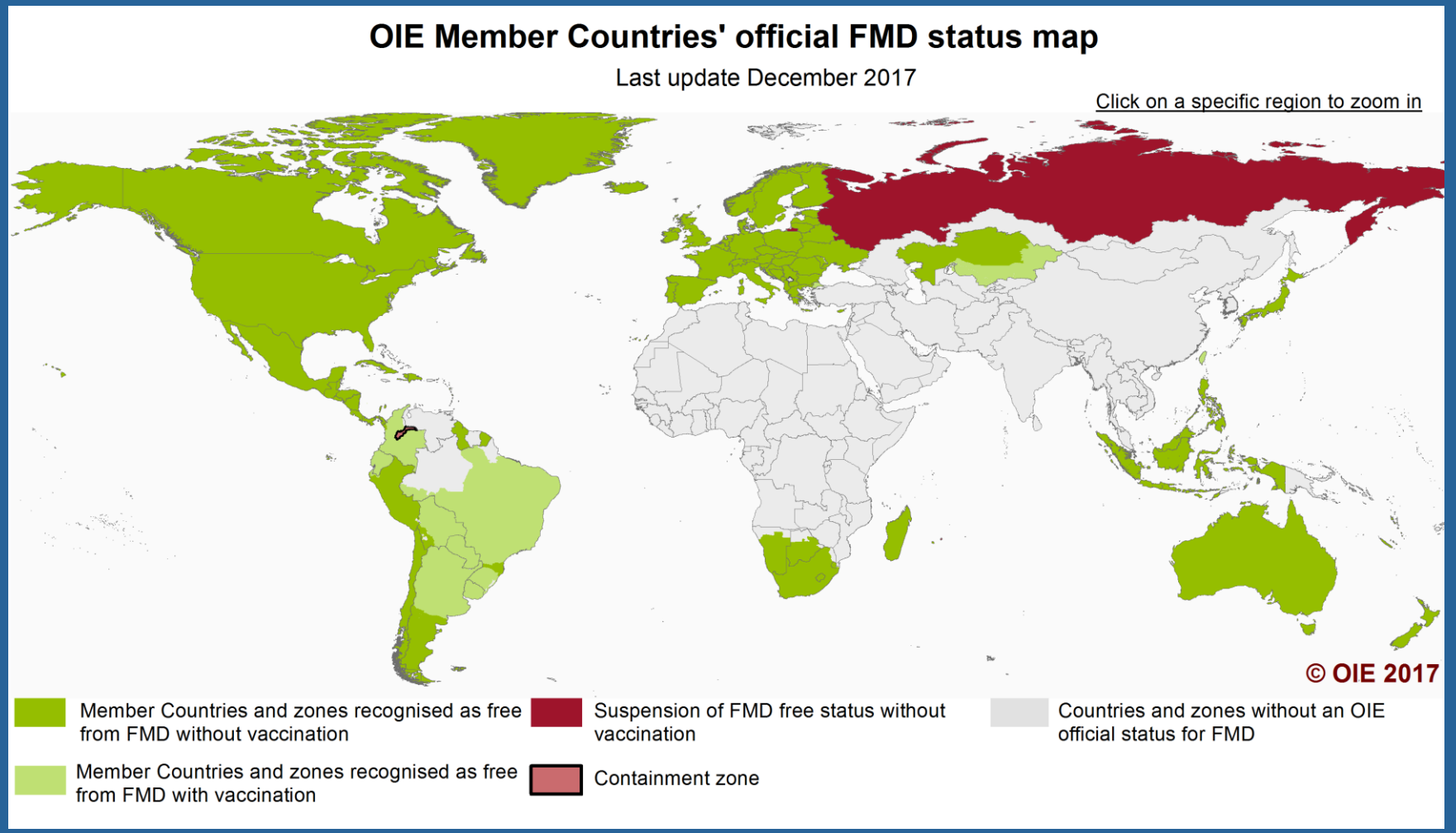
'The Republic of vaccines The pact of Macron with labs to forcibly vaccinate'

By Media Press, 11 July 2017

‘Department of Agriculture to ensure cattle imports from Brazil will be free from foot-and-mouth disease’

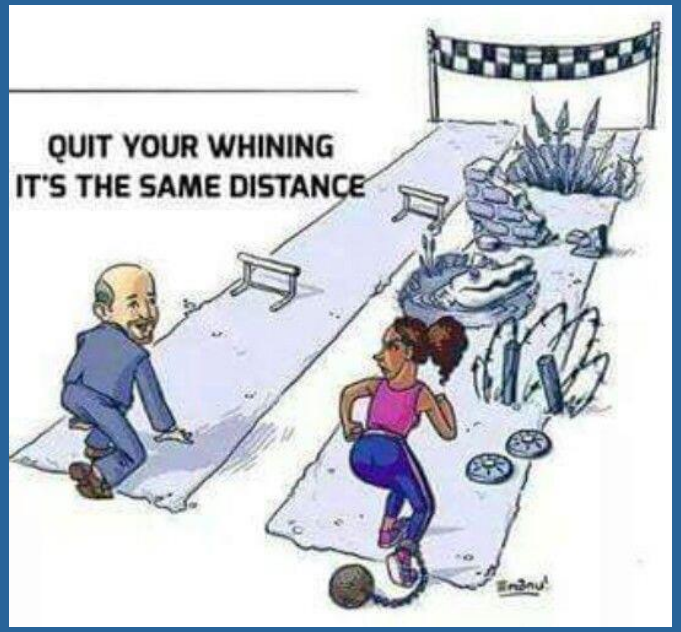
By Jasper Y. Arcalas - November 6, 2017





The current problems experienced in cold chain transportation

By Unicef, 5 August 2015



Friday, 31 August, 2001, 21:33 GMT 22:33 UK

Army joins foot-and-mouth battle

Soliders will join efforts to contain the disease

2010 FMD outbreak, Korea

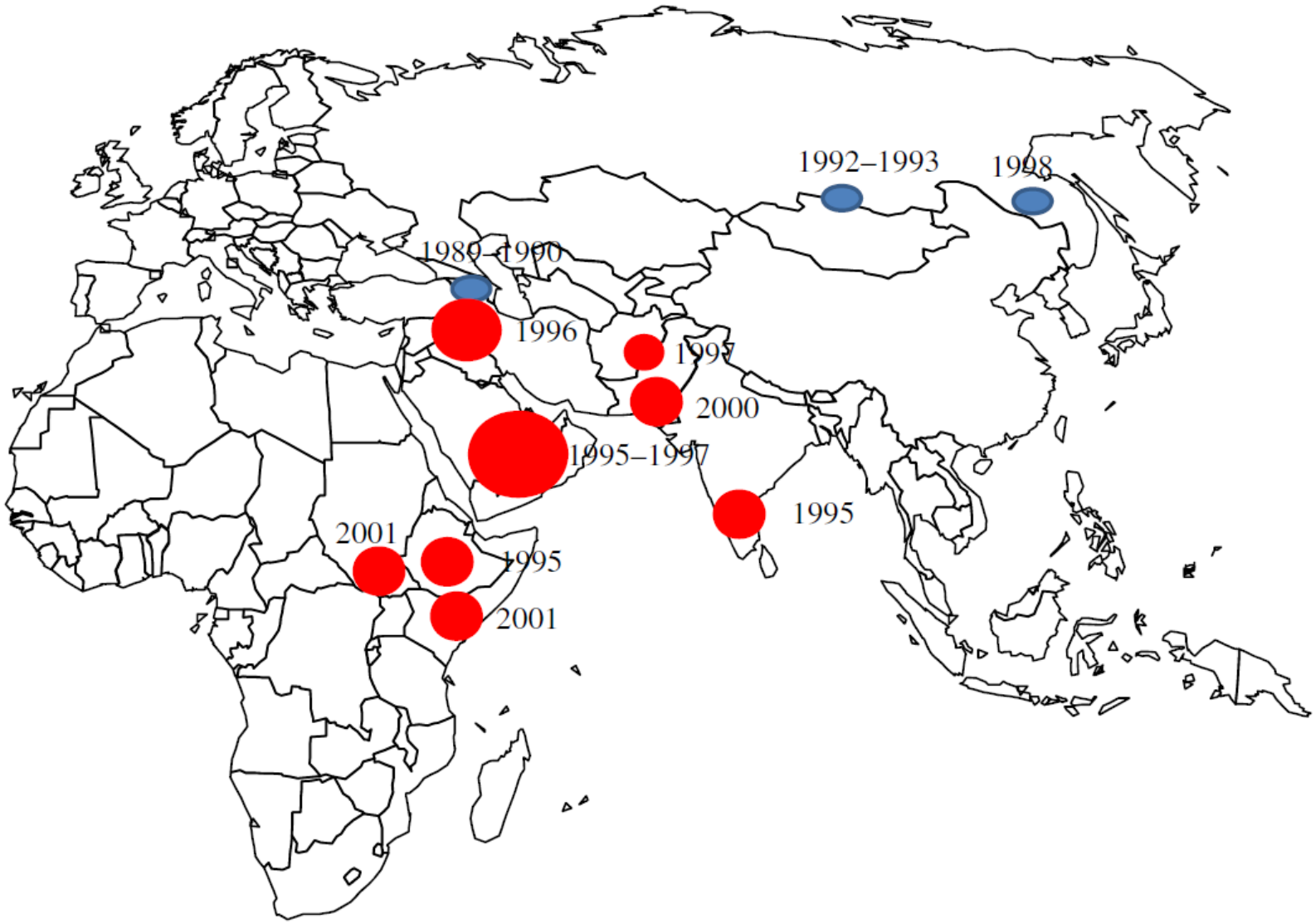


Figure 2. Last occurrence of wild rinderpest virus (red), and outbreaks of vaccine-derived rinderpest (blue).

From: Roeder et al., Phil. Trans. R. Soc. B. 368: 20120139

‘Farmers sue for damages in Pirbright foot-and-mouth outbreak’

By Guardian, 17 October 2008

Police secure the Pirbright laboratory in Surrey in August 2007. Photograph: Cate Gillon/Getty Images

Vaccine link to bleeding calf syndrome confirmed

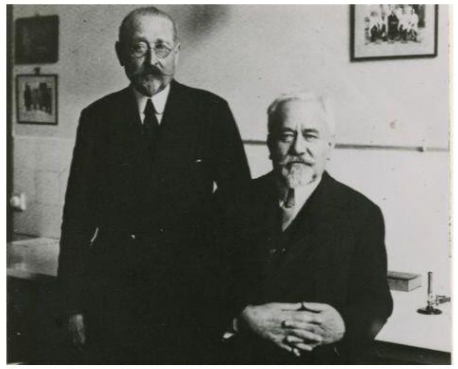
Monday 13 June 2011 9:24

Gemma Mackenzie

Results from a Defra-funded study have found a calf was more than 10 times more likely to develop Bleeding Calf Syndrome if its mother had been given the PregSure BVD vaccine prior to its birth.

The study carried out by the Animal Health and Veterinary Laboratories Agency, Scottish Agricultural College, and Moredun Research Institute, found a "significant association" between the PregSure BVD vaccine and Bovine Neonatal Pancytopaenia (BNP), commonly known as Bleeding Calf Syndrome.

1921 : MISE AU POINT DU BCG, VACCIN ATTÉNUÉ CONTRE LA TUBERCULOSE, PAR ALBERT CALMETTE ET CAMILLE GUÉRIN.



Bien que le bacille responsable de la tuberculose fut identifié en 1881 par le microbiologiste allemand Robert Koch, au début du XXème siècle, aucune solution efficace n'était proposée aux patients et la tuberculose continuait à tuer chaque année en France près de 100 000 personnes. C'est seulement en 1921, que les pasteuriens Albert Calmette et Camille Guérin propose la première vaccination anti-tuberculinique à partir du bacille bovin vivant atténué, le fameux BCG ou « bacille de Calmette et Guérin ». La vaccination par le BCG connaîtra une extension mondiale notamment lors de campagne de vaccination de masse en Europe, en Asie, en Afrique et en Amérique. Associée à l'antibiothérapie et à une amélioration de l'hygiène, la vaccination par le BCG permettra de sauver des millions de vies. Cependant, l'augmentation de la précarité des conditions de vie dans les pays industrialisés et l'apparition du sida favorisent la réémergence de cette maladie que l'on avait tendance à considérer comme un fléau d'un autre âge.

Les Héritiers Pasteur, un documentaire "Le Monde en Face"
Mardi 13 novembre à 20h40 sur France 5

Photo : Albert Calmette (assis) et Camille Guérin (debout) dans leur laboratoire du BCG, à l'Institut Pasteur en1931. Arrivé dans le laboratoire de Calmette en qualité de préparateur en1897, Guérin et Calmette travaillèrent ensemble jusqu'à la mort de ce dernier en 1933.

Institut Pasteur

PharmacoEconomics
DOI 10.1007/s40273-015-0335-2

CrossMark

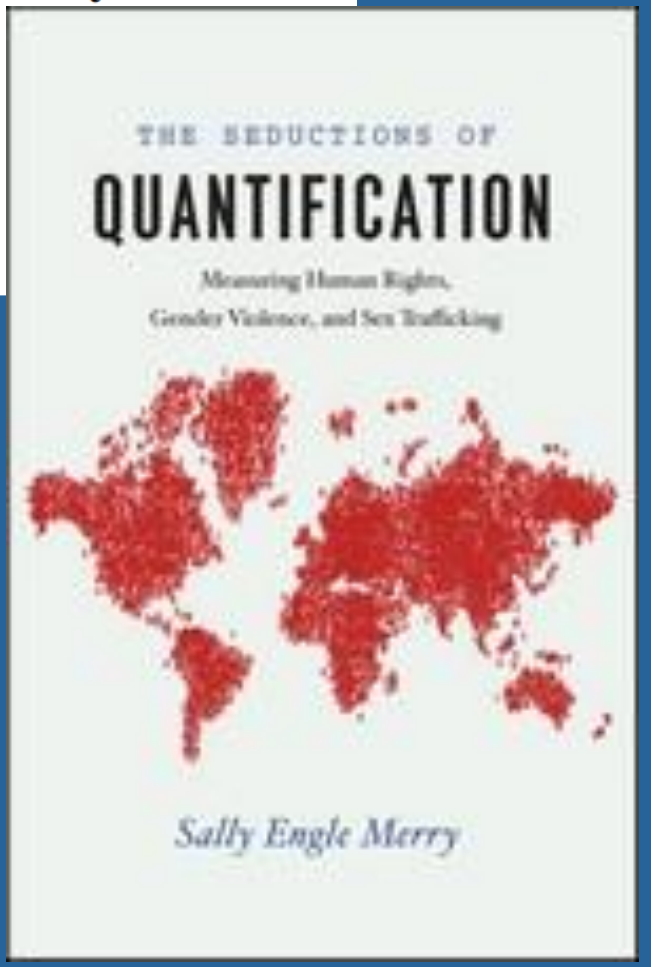
CONSENSUS STATEMENT

Methods for Health Economic Evaluation of Vaccines and Immunization Decision Frameworks: A Consensus Framework from a European Vaccine Economics Community

Bernhard Ultsch[1] · Oliver Damm[2] · Philippe Beutels[3] · Joke Bilcke[3] · Bernd Brüggenjürgen[4] · Andreas Gerber-Grote[5] · Wolfgang Greiner[2] · Germaine Hanquet[6] · Raymond Hutubessy[7] · Mark Jit[8,9] · Mirjam Knol[10] · Rüdiger von Kries[11] · Alexander Kuhlmann[12] · Daniel Levy-Bruhl[13] · Matthias Perleth[14] · Maarten Postma[15] · Heini Salo[16] · Uwe Siebert[17,18] · Jürgen Wasem[19] · Ole Wichmann[1]

'The main target audience for this guide is **economists and health service researchers** in the public and private sectors who conduct and critically appraise economic evaluations of immunization programmes at the local, national, regional and global levels.'

Source: WHO guide for standardization of economic evaluations of immunization programmes, 2008



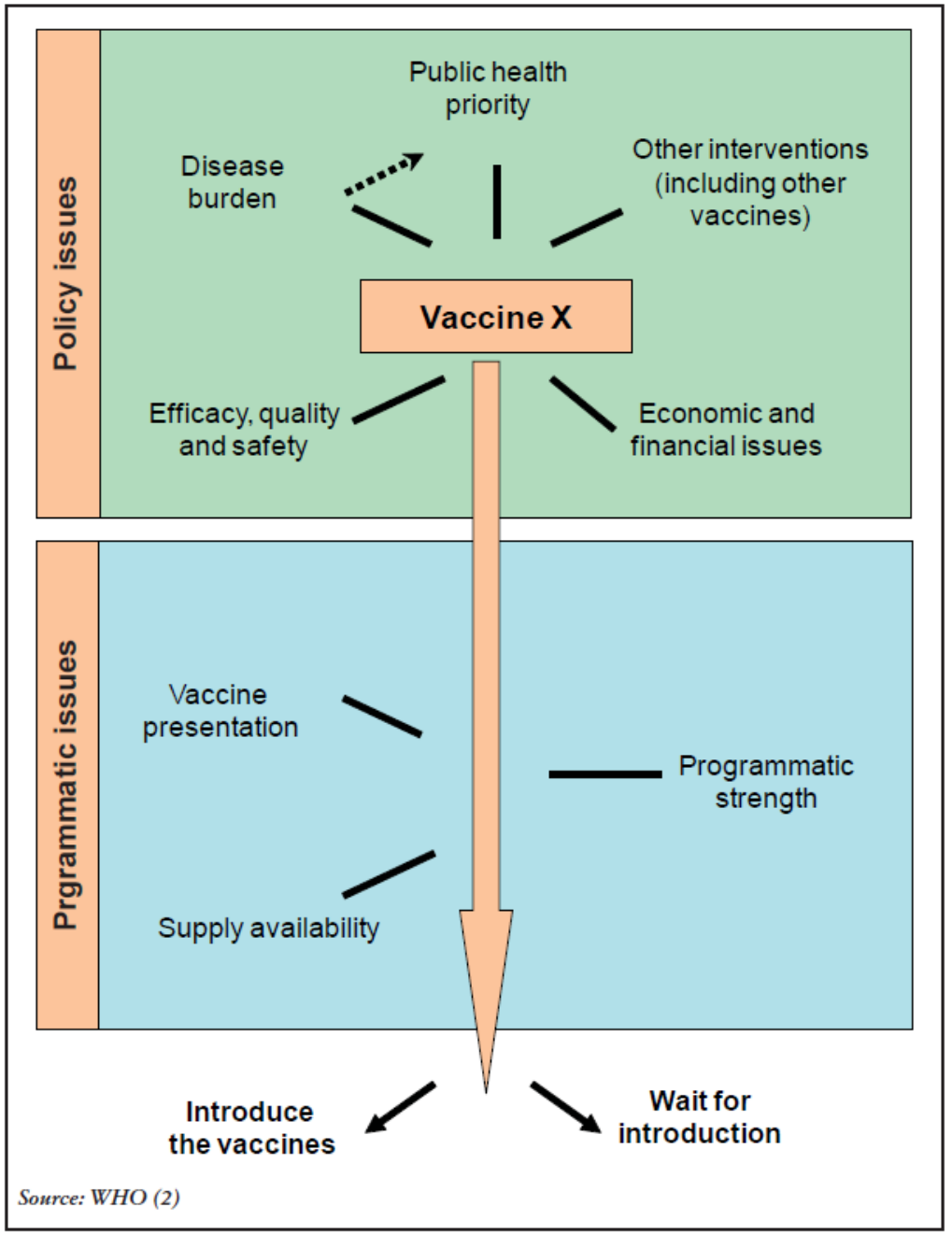
Regulatory prescriptions

Political ideologies

Consumer preferences

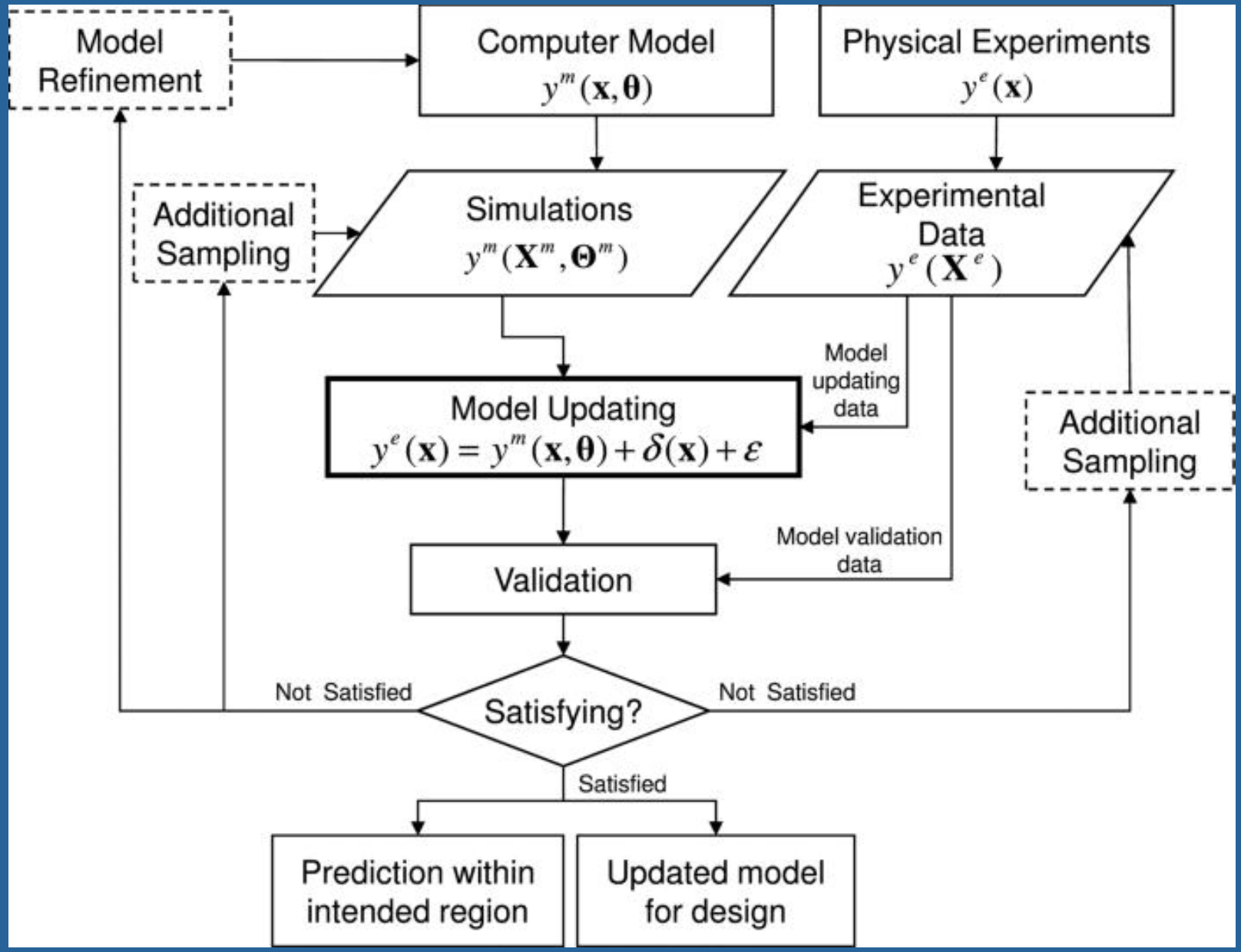
Manufacturers' efficiency needs

Figure 1: Evidence-based decision-making



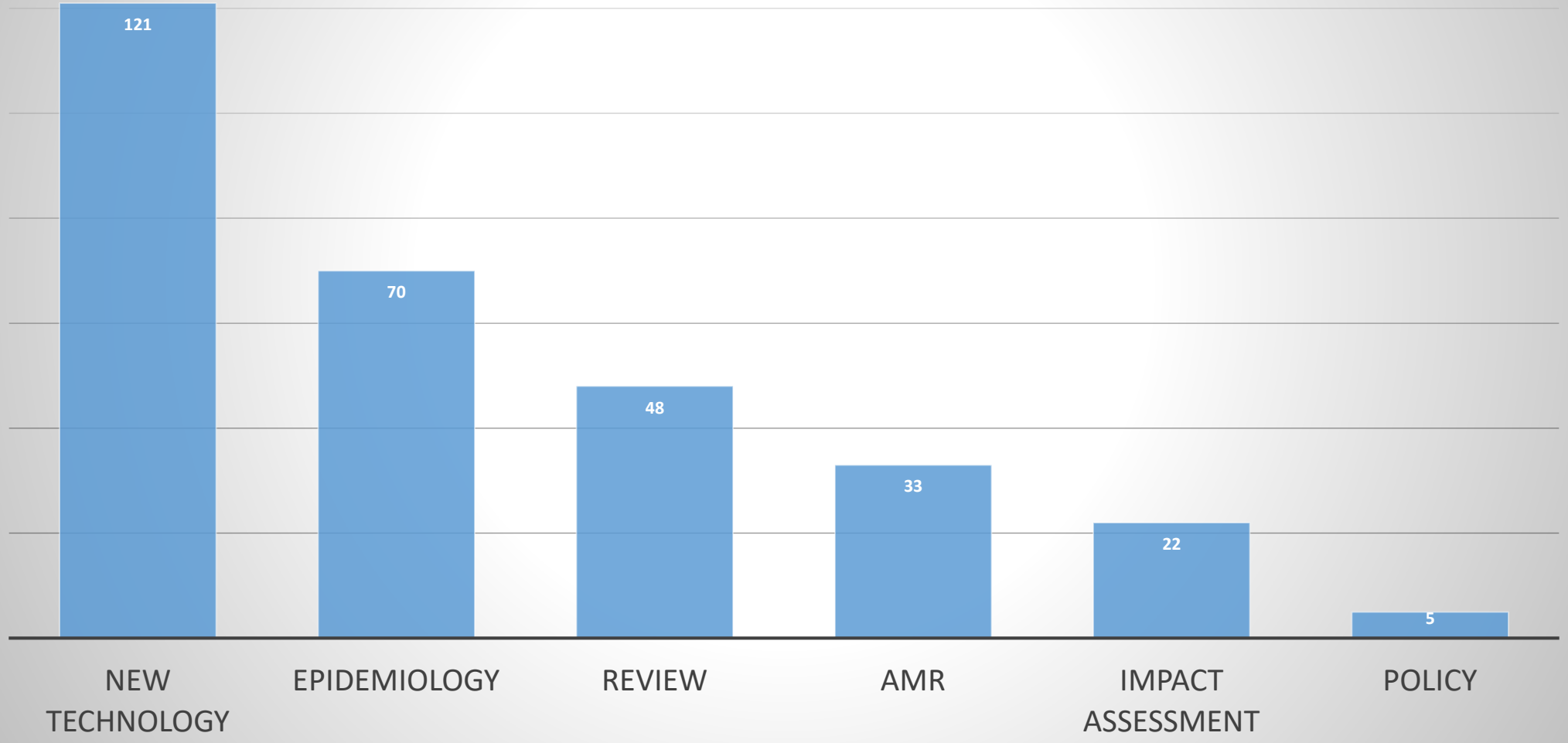
Source: WHO (2)

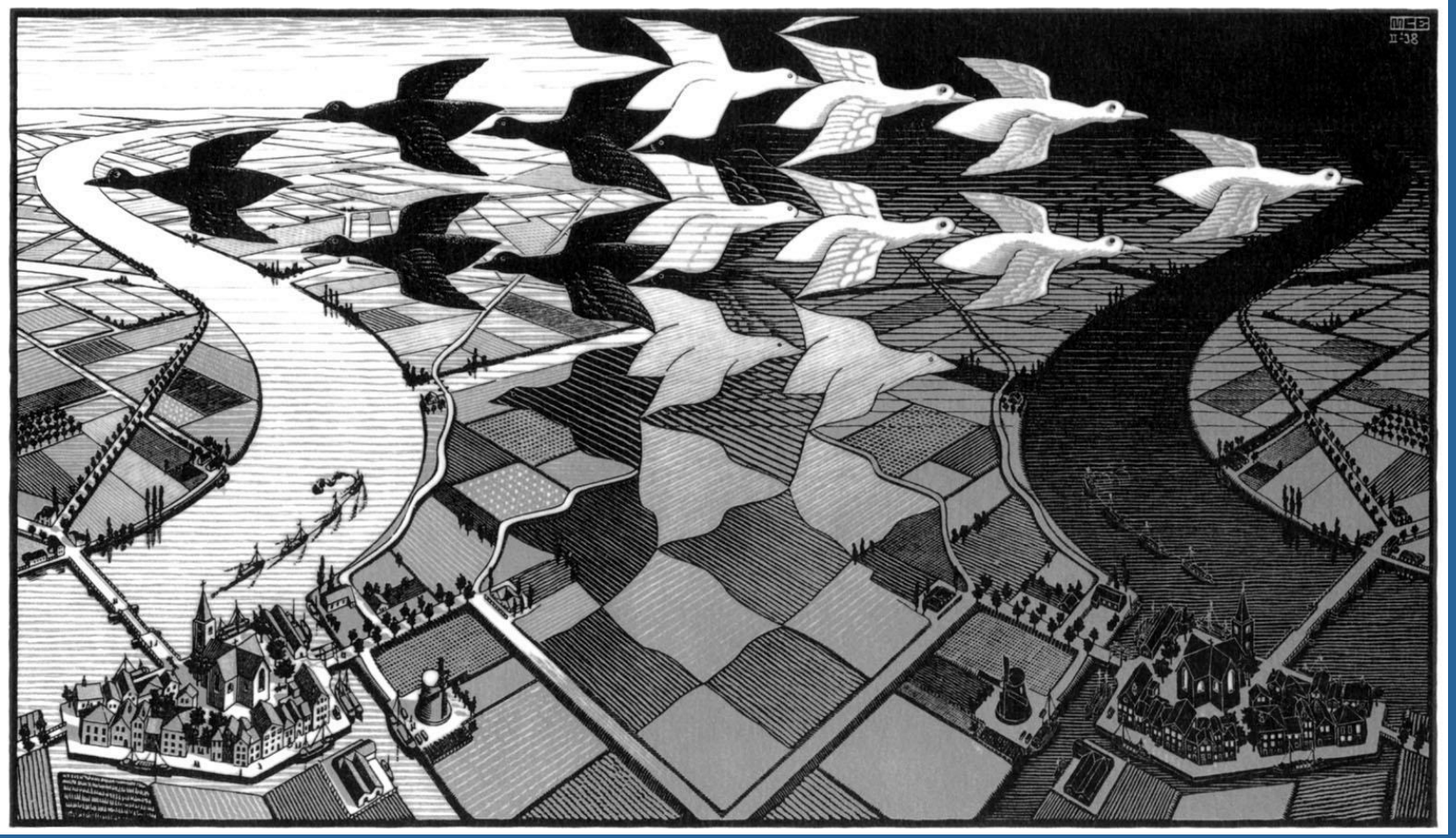
Jasanoff, N. 2002. New Modernities: Reimagining Science, Technology and Development. *Env. Values* 11: 253–76



Source: Journal of Mechanical Design - American Society of Mechanical Engineers

Published papers (N)

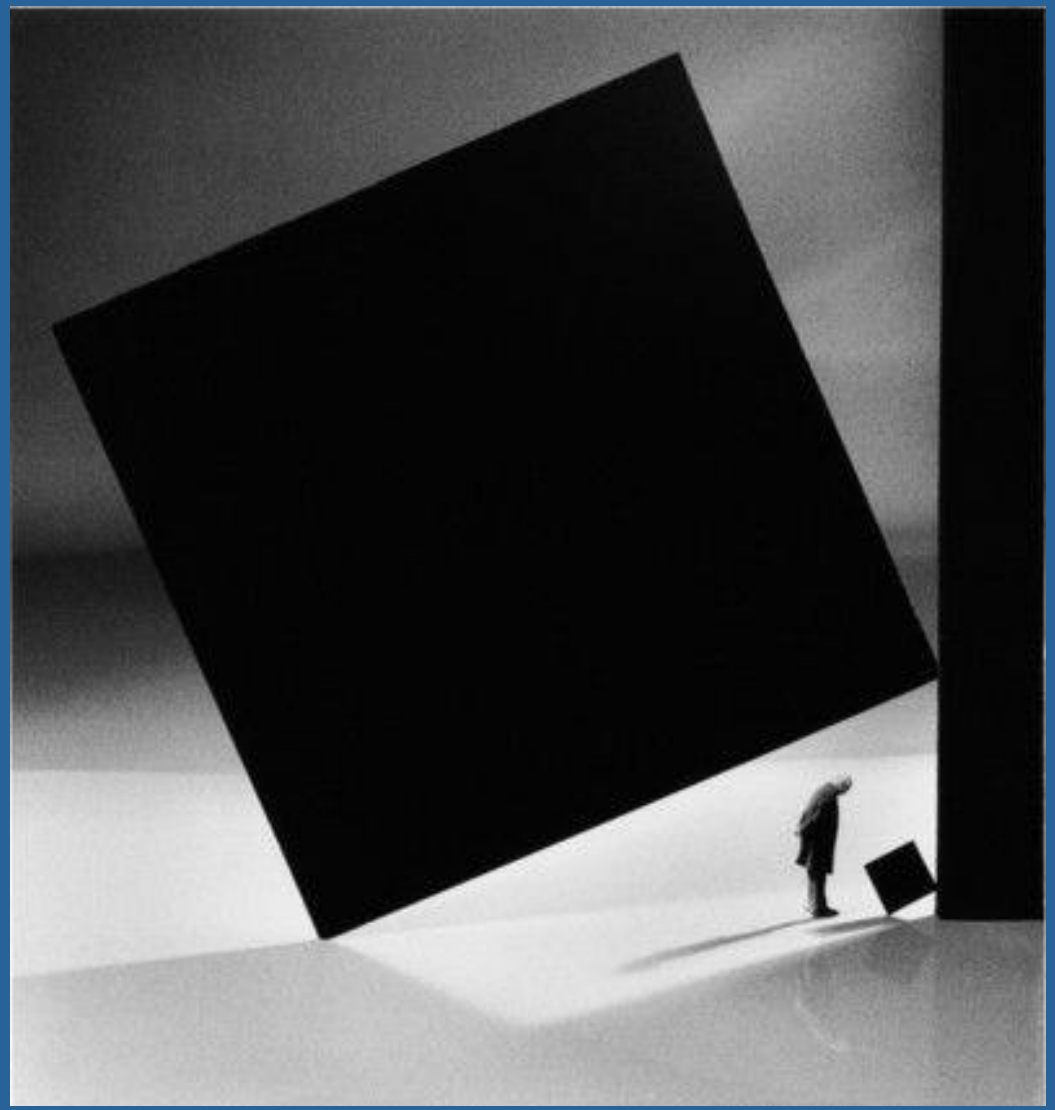




Day and Night, 1938, by MC Escher. Images courtesy of Collection Gemeentemuseum Den Haag/the MC Escher Company

The centrality of vaccine development for sustainable future will only be justifiable **if it does not rely on privileged knowledge, predictive capability and unique right to formulate scenarios for the future.**

(adapted from [1]Jasanoff, N. 2002. New Modernities: Reimagining Science, Technology and Development. *Env. Values* 11: 253–76)



Merci beaucoup!

Contact: camille.bellet@Liverpool.ac.uk