

Feature

INTERNATIONAL DISEASE CONTROL

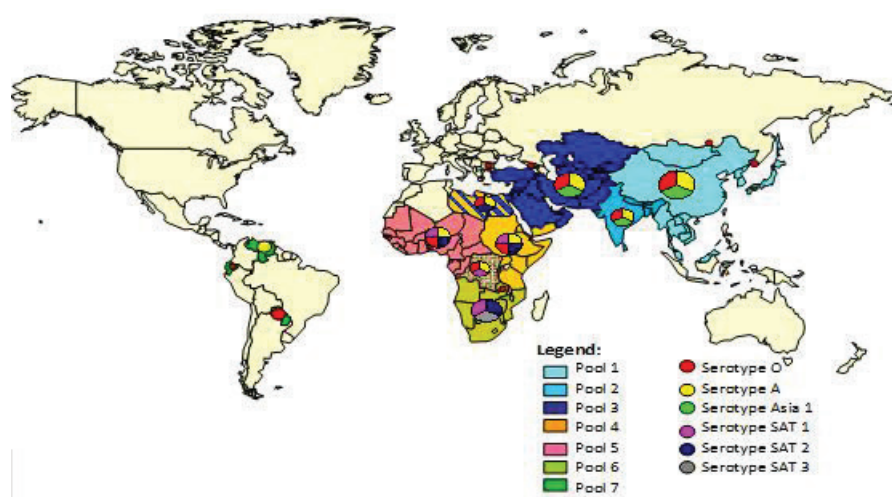
Progressive control of FMD on a global scale

This month, the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) are launching a new global strategy for the control of foot-and-mouth disease. Keith Sumption, Joseph Domenech and Giancarlo Ferrari describe how the strategy has been based on a progressive control pathway for FMD and what it is hoped will be achieved

FOOT-AND-MOUTH disease (FMD) is recognised as one of the most important, if not the most important, diseases of animals. In endemic countries, it is among the most common diseases of ruminants and pigs, with exposure in the first year of life regarded as the norm and multiple episodes occurring during the productive life of an animal.

The distribution of FMD roughly mirrors economic development; wealthy countries have, through enormous effort, mostly eradicated FMD, and the setback of an incursion can cost millions or billions of dollars to control. Globally, although animals and animal products are moving at an unprecedented rate from production to consumption areas, sustained FMD freedom has been achieved in over 60 countries and, possibly, one of the seven FMD serotypes (serotype C) has disappeared from circulation, in part as a result of the general control efforts in Europe and South America.

FMD is preventable, and control is considered a public good, with the state responsible for policy and prevention measures. However, in many situations, strong support from the private sector has been important to initiate and maintain effective national programmes, while, in others, the scale of public investment



Global distribution of FMD illustrating the countries regularly or recently (2010-2012) affected by viral strains circulating in the seven FMD virus pools. Small circles of single colour indicate serotypes involved in incursions to free regions or which were the sole serotype involved in outbreaks in non-free countries in 2011 (source: EuFMD)

required for comprehensive national programmes has inhibited such initiatives. At a time of global economic stress, public policy on FMD prevention is under review in many countries, with an acknowledgement that greater private sector investment is crucial, whether FMD is to be managed in an endemic country at herd level or as a national eradication programme.

Given its high incidence across the population, FMD impacts on production efficiency, livelihoods and food security at a local level, but also at a global level on every household, through higher international food prices.

Considering all the above factors, a 'Global Strategy for the Control of FMD' has been developed by the FAO and the OIE. The strategy will be launched at a global conference in Bangkok in June 2012. It is based on the 'Progressive Control Pathway for FMD' (PCP-FMD)

(Anon 2011), a framework for the development of sustainable strategies for FMD management, which should assist in setting national policy and attainable outcomes, both short and long term. National PCP targets will contribute to regional coordinated 'roadmaps' for PCP progress and will recognise that the optimum level of costs and benefits differs between sectors and countries.

Progressive control in Europe and its neighbourhood

The six circulating serotypes of FMD virus are distributed in seven regional FMD virus pools (as illustrated in the map, above). Within these pools, strains evolve independently and, in the case of A and SAT serotypes particularly, require specific, tailored vaccines. These specificities, mirroring intraregional trade patterns, argue for regional vaccination and control programmes, coupled with sufficient

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monitoring to detect emergent FMD virus that escapes control by the vaccines in use.

An eighth virus pool previously existed in Europe, but became extinct in the 1970s following approximately 15 years of coordinated control measures applied by countries adopting the FAO's European Commission for the Control of FMD (EuFMD) Strategy. This comprised national comprehensive actions within a regional programme, largely involving vaccination on mainland Europe, and the steady evolution of sanitary standards for trade between member states and non-free regions. At its peak, over 200 million animals were vaccinated yearly in Europe, and FMD cases dropped approximately 100-fold between 1954, when the EuFMD Commission was founded, and the mid-1970s, and enabled preventive vaccination to cease in all European countries west of the former USSR by 1992.

The European effort was founded on publicly funded vaccination programmes and/or stamping-out of infected herds, with a minority of countries, such as the UK, adopting stamping-out as the primary control measure. Since 1990, 11 incursions of FMD into the free countries of Europe have occurred, affecting nine countries. Most incursions have been associated with entry from FMD virus pool 3, comprising the endemic countries in 'West Eurasia', of which Turkey shares land borders with FMD-free European countries. The most recent incursion was in 2010/11 in Bulgaria.

Virus pool 3 involves at least 14 countries from Pakistan in the east, to Kazakhstan in the north, and Turkey in the west, and regional epidemics ('pandemics') sweep through the livestock population at one- to three-year intervals. Continuous attention to this area is required, with the aim of detecting emergent strains before they spread to the wider region, including Europe. In 2010, a pandemic of a type O lineage (Panasia II ANT-10) reached as far as Bulgaria and, by unknown routes, caused outbreaks in Libya.

This region is not the only source of risk: in 1996, Albania and the Former Yugoslav Republic of Macedonia were affected by an incursion of a type A virus from pool 2 (South Asia); in 2001, the ultimate source of the virus causing outbreaks in the UK, Ireland, France and the Netherlands was probably in pool 1 (East Asia); and in 2012, Egypt and Libya have been affected by devastating epidemics of SAT2, caused by viral genotypes from pool 5 (West-Central sub-Saharan Africa).

Progressive control in West Eurasia

As a result of the increasing frequency and impact of regional epidemics, the EuFMD Commission, together with the wider FAO, convened a regional meeting in 2008 in Shiraz, Iran, at which a long-term, regional approach to FMD management was developed. Known as the 'West Eurasia Regional Roadmap', it was the first time the PCP-FMD (illustrated below) was used

for the assessment of national progress and for identification of national and regional supportive actions.

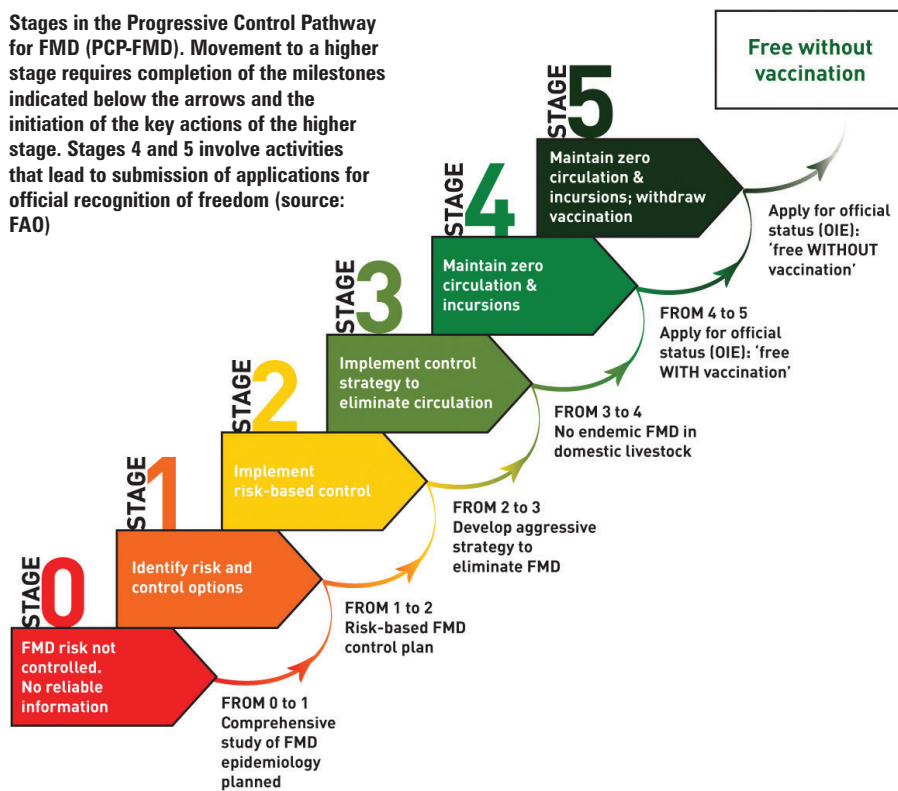
The PCP-FMD is composed of five stages that guide the planning and management of efforts to increase the level of control to the point where an application to the OIE for official recognition of freedom from FMD (with or without vaccination) may be successful and sustainable. Stage 1 assists in identifying appropriate control options, and stage 2 involves the implementation of the chosen policy. It is not expected in stage 2 that control measures will reduce FMD incidence across the entire population. Measures might be largely privately financed, or a balance of public funding (for example, in border regions) and private funding (for example, vaccination programmes supported by livestock farmers). Stage 2 therefore does not imply large investments at national level, but if the producer is to pay for preventive measures, he/she will expect adequate information and access to effective vaccines, and this in itself will create demand for information and results to guide vaccine selection.

However, stage 3, where progressive elimination of virus circulation is the objective, normally requires very significant national capacity and ongoing investment, including the ability to regulate internal trade and ensure sufficient immunity is maintained in critical populations to prevent virus circulation.

In 2012, as a result of national efforts, multiple projects and donor support, progress with the PCP has been seen in almost every part of the West Eurasia region. No country now remains in stage 0, and the information flow has informed regional vaccination planning and reaction to emergent FMD virus threats. It is early days for the PCP approach, but the resulting reflection at a national level on the desired outcomes, on public and private responsibilities, on service delivery and on evaluation of impact, is sufficiently encouraging to suggest similar processes would assist for other highly contagious diseases.

Since 2008, four regional roadmap meetings have been held to assess progress; these have also been a tremendous opportunity to share experience and information relating to FMD surveillance and control and, as a result of PCP-related activities, three large regional FMD epidemics have been detected, involving three different FMD serotypes (Anon 2012). Knowledge of these epidemics has benefited both the affected countries as well as non-affected countries, including in the EU.

Stages in the Progressive Control Pathway for FMD (PCP-FMD). Movement to a higher stage requires completion of the milestones indicated below the arrows and the initiation of the key actions of the higher stage. Stages 4 and 5 involve activities that lead to submission of applications for official recognition of freedom (source: FAO)



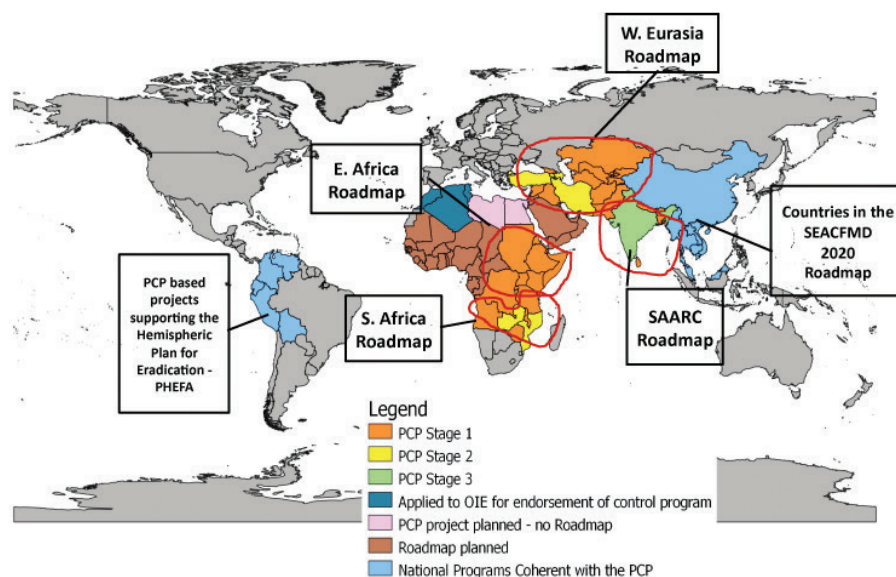
Adoption and application of the plan

The PCP approach has now been adopted as a joint tool between the FAO and the OIE, assisting national-level priority and activity planning, and comparative progress between countries. Resolutions of the OIE have enhanced the motivation for countries to progress through the PCP, with the possibility of official OIE endorsement of national FMD control plans for countries in PCP stage 3 or higher. The PCP-FMD approach has been applied by the FAO and the OIE in major regions of four continents (see map, right). Longer-term, regional coordinated efforts ('regional roadmaps'), based on PCP progression up to 2020 or 2025, have been developed in Southern Africa (from 2011), Eastern Africa (from 2012) and West Eurasia (from 2008). In South Asia (SAARC) countries, the regional roadmap complements the long-term regional roadmaps in South-East Asia and China (SEACFMD campaign). There are also PCP-based projects to assist the progressive elimination of remaining foci of infection in South America.

In the roadmaps, the expected national PCP progress to 2020 has been charted, and international agencies and donors are encouraged to support national PCP action plans. Encouragingly, some countries have adopted the PCP into their cycle of outcome-oriented national planning. In many situations, however, the process of revising FMD policy based on comprehensive assessment of options, benefits, responsibilities and stakeholder interests, is unfamiliar, and needs support. Access to FMD prevention services remains constrained by regulatory hurdles, and the need to communicate with livestock keepers and veterinarians on their role in response to changing local FMD risks is still insufficiently recognised. The public and private responsibilities are central to discussions on making the Global FMD Strategy operational after June 2012.

Integrated approach

Given the current geographical restriction of the seven FMD virus pools, regional FMD control roadmaps could be the main mechanism by which global progress in FMD control is achieved (Anon 2011). However, in the past 50 years, the main progress against FMD has been at the margins of these endemic regions, almost entirely in the developed or transition countries. The initiative of the FAO and the OIE, to be launched at the Global Conference on FMD Control in June 2012, aims to foster progress within the endemic regions through an emphasis on establishing national FMD control programmes sustained by local economic drivers for public and private investment,



Use of the PCP framework to assist national level FMD management. The PCP stage of countries, and their expected progression to 2020 or 2025, has been identified at regional workshops of the FAO and the OIE in four regions in 2011/12. The PCP has been used in regional projects (Andean region of South America by the FAO) and it has been aligned with the SEACFMD roadmap in South-East Asia and China (source: FAO)

with the aim that, within 15 years, countries currently at the lowest stage will have progressed at least two steps along the FMD pathway, and those currently in stage 2, will advance to stage 4 or stage 5 (on track to become free without vaccination).

The strategy recognises that countries will decide which level is optimal for them and some may not be able or not

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want to reach FMD-free status. The global achievement of a minimum of stage 2 in all countries in 15 years could be argued to have achieved a level of global control since, at the very least, each country would have in place a programme addressing the needs of its most at-risk sectors and providing the essential monitoring programmes for regional progress.

In the immediate future, the flow of information from stage 1 countries on virus circulation alone will generate a critical mass of information for veterinarians on which they can base their recommendations for appropriate vaccines, at herd or national level, and for development of regional guidance ('harmonised vaccination') for countries

that share the same virus pools. It will also greatly boost the information needed by FMD-free countries for risk mitigation.

The initiative should result in greater public and private demand for vaccines and advisory services, and successful FMD control models should replicate themselves if the benefits are clear. International support will be essential to assist countries to get started on the pathway, to develop the regional expertise to guide progress, to sustain regional and global FMD reference laboratory services and to assist vaccine selection and programme monitoring, and research and development to improve the utility and duration of immunity of FMD vaccines.

The tools largely exist to initiate progressive control, and it would be to the benefit of all to have regional coordinated actions against FMD in all virus pools, as Europe has demonstrated with success in its own area.

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■ Details of the FAO/OIE Global Conference on FMD Control, which is to be held in Bangkok, Thailand, from June 27 to 29, are available at www.fmdconference2012.com

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