

## Are we Foot and Mouth Disease ready?

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### Abstract

A transdisciplinary pilot study with Australia's livestock industries is bringing multiple stakeholders together as equal partners, to examine the complex problems around animal disease management. These problems include disease surveillance and on-farm biosecurity practices. The pilot groups are established in industries susceptible to foot and mouth disease, namely dairy and beef cattle, pork, sheep and goats. The Agricultural Innovation Systems framework is being evaluated to determine its effectiveness as a tool to improve partnerships between stakeholders. These stakeholders include livestock producers (farmers), private and government veterinarians, local council representatives, and industry personal including from saleyards and abattoirs. Stimulation of innovative solutions to issues arising from conflicting priorities and limited resources around animal disease management are also expected. Using a participatory communication approach, the impact of the pilot on trust and relationships is being evaluated. The sustainability of the Agricultural Innovation Systems approach to address complex issues around animal health management is also being assessed. The aim of the study is to strengthen Australia's preparedness for an emergency animal disease outbreak, such as Foot and Mouth Disease.

### Keywords

Health communication; Scholarly communication; Science communication: theory and models

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### Introduction

Australia's animal industries rely on their 'clean and green' status, free from many diseases that are endemic elsewhere in the world [East et al., 2016; Matthews, 2011]. This status is hard won, relying on a mixture of pre-border, border and post-border control activities. On-farm surveillance (monitoring for and reporting unusual

signs of disease) is a key component of the post-border control activities. An outbreak of Foot and Mouth Disease (FMD) in susceptible livestock, such as beef and dairy cattle, sheep, goats and pigs, would have devastating impacts on farming families and communities and Australian domestic and international markets [Buetre et al., 2013; Convery et al., 2005]. Understanding the barriers to and drivers for effective and sustainable on-farm surveillance will inform strategies designed to support and strengthen current surveillance efforts.

Livestock producers are ideally placed to undertake on-farm surveillance. Their daily practices are embedded in managing animal health and preventing disease to maximise production. Harnessing the knowledge and experience of producers as part of the surveillance system strengthens Australia's preparedness for an FMD outbreak. To reduce the likelihood of exposure to disease and increase the likelihood that any outbreak will be controlled quickly, robust and reliable on-farm surveillance is vital.

Research has established that by reducing the time between the initial infection with FMD and when the disease is first diagnosed, the duration of the outbreak and subsequent financial and emotional impacts can be significantly reduced [East et al., 2016; Garner et al., 2016]. However, the reduction in this time period relies on understanding more about what might enable or prevent early reporting of unusual disease signs.

In background work to the project, Maru et al. [2017] found that intersecting systemic and behavioural factors are at play to restrict improvement in animal disease surveillance. These factors include low trust, strained relationships, low risk perception, and low priority and motivation. A lack of trust and partnership between stakeholders has also been identified as a barrier to early reporting of animal diseases [Manyweathers et al., 2017; Palmer, Sully and Fozdar, 2009].

The FMD Ready Farmer-led surveillance project is tasked with considering the role of stronger partnerships among stakeholders in improving animal disease surveillance. This includes monitoring, detecting and reporting unusual signs of disease in livestock. To create a platform where issues surrounding the current surveillance system can be discussed, the Agricultural Innovation Systems (AIS) framework has been adopted. The AIS approach has been used historically in developing countries to enhance information sharing and problem solving at local levels. AIS can bring systems change by creating space for shared perspective and the co-creation of solutions by multiple stakeholders [Coutts et al., 2017; Turner et al., 2017]. By adopting a participatory approach to communication between stakeholders, learning becomes a collective activity [Metcalf, 2019]. Problems are identified and solved jointly, with new knowledge being produced [Coutts et al., 2017]. The aim of this project is to pilot AIS as a framework to improve partnerships and surveillance in livestock industries across Australia.

## Methodology

Around Australia, five AIS pilot groups have been established within livestock industries that are susceptible to FMD. Members of the pilot groups were identified by stakeholder analysis [Hayes et al., 2017; Hernández-Jover et al., 2012]. The groups include livestock producers, government and private veterinarians, stock agents, and abattoir and local council representatives, as well as industry and

government representatives and the research team. The pilot groups have met face-to-face between three to four times a year since 2018, with the last meetings scheduled before the end of 2020. Evaluation data were collected in a baseline survey prior to the initial meetings. The survey included questions around trust and networks, as well as surveillance activities and awareness of FMD. An end line survey will be undertaken to identify any changes over the life of the pilot group. Evaluation data will also be collected using the Most Significant Change (MSC) framework [Davies and Dart, 2005; Limato et al., 2018], to capture nuanced data on the impact of the AIS approach on the participants. This will include any change observed by the participants on animal disease management on their own property and more generally.

## Results

The AIS approach has allowed for open and participatory discussion around local/state and national issues identified within the current surveillance system. Some innovative solutions are currently being trialled. These solutions include making connections between producers and smallholder community groups, to share information and strengthen overall understanding and implementation of on-farm biosecurity actions. Training in post-mortem examinations, low stress animal handling and nutrition have also been undertaken in some of the pilot groups.

There is emerging evidence that producers in the pilot groups have shifted their disease surveillance focus to include exotic diseases. The effect of COVID-19 will also contribute to the ongoing discussion of how to maintain preparedness for a low likelihood but potentially catastrophic animal disease outbreak event.

The strengthening of relationships and deepening of trust within the pilot groups is a tentative observation at this stage in the project. There have been numerous examples of shifts in power dynamics and a deeper understanding of alternate views and priorities. This has been accompanied by an openness and honesty in group discussions. The MSC approach will capture more of these changes. Data collection is underway, with the final evaluation report being completed at the end of 2020.

## Discussion and conclusion

In the development of the project, it was found that the complex nature of on farm biosecurity surveillance, means they are not responsive to top-down approaches of communication and management [Maru et al., 2017]. A common top-down approach is the deficit model of science communication that sees provision of more information or regulation as sufficient for problem solving [Seethaler et al., 2019]. Instead, the AIS approach allows participants to flip the traditional top-down deficit model approach to disease surveillance. It creates a platform where knowledge can be co-created, valued and shared. AIS has allowed for stakeholders to meet and to hear alternate perspectives on common problems.

Early results suggest the benefits of the AIS approach are twofold. Firstly, new partnerships between participants are developed and strengthened as different perspectives become visible. With the sharing of perspectives comes not only empathy and understanding but also challenges and adjustment. This is followed

by new ways of thinking about old issues. Concurrently, the strong networks required to trial some of the innovations are being created. Increased trust also works to strengthen these networks.

Another outcome expected from the AIS approach includes improved producer capacity to monitor for and report any unusual signs of disease in their animals. This capacity includes both willingness and ability. The increased trust seen among pilot participants also contributes to improved capacity. Trust between stakeholders creates conduits for animal disease information to be shared safely and respectfully. The multidirectional sharing of information and creation of knowledge and solutions creates a feedback loop that increases trust and respect.

The changes in producer surveillance capacity will be evaluated using the base- and end-line surveys. However, to sustain a partnership model where reporting and monitoring are fully supported will require significant changes to the current surveillance system. These changes would include placement of appropriate district veterinarians and helpful feedback systems for reporting. These changes will take time and resources. Some future work of this project will include applying the AIS approach to extend the pilot groups to other regions and industries. Examination of the complex challenges around biosecurity and surveillance at the state and national level using the AIS framework is also underway.

The limitations of the project include the time needed to gain a collective understanding of the AIS framework and for relationships to be built. The AIS approach is revolutionary in the animal disease surveillance arena in Australia. This has meant that progress in bringing all stakeholders along to understand the process has taken time. The three year project is moving towards completion, with the outcomes still unfolding. The focus in the last year of the project has been on how to sustain the benefits of the AIS pilots. This includes maintaining and strengthening relationships and supporting the surveillance focussed outcomes.

Continuously improving on-farm biosecurity, including monitoring for and reporting unusual signs of disease, can play an important part in reducing the risk of introduction and spread of animal diseases. For this to happen, a deeper understanding by stakeholders of each other's priorities and challenges is important. This requires a platform where voices can be heard with equity, safety and respect. There also needs to be an arena for stakeholder driven solutions to be supported and evaluated.

Adoption of participatory communication within the AIS framework can create an environment of trust and respect, where knowledge and experience can be shared. This environment then results in a platform for solving complex problems and enhancing Australia's preparedness for animal disease outbreaks, one discussion at a time.

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