



## Epidemiology in our personal lives: The case of human flu *Lesley van Helden*

Concepts such as epidemiology and one health are often viewed as large and abstract, not applying to the individual but rather dealing with populations and therefore not having much of an effect on specific animals or people.

However, the opposite is true. Every big picture is influenced by the behaviour of each individual within it.

As animal health professionals, we apply epidemiological principles in our lives at work daily. We do this by enforcing quarantine and biosecurity measures on properties infected with animal diseases to prevent the spread of outbreaks. We also take biosecurity precautions ourselves to prevent acting as fomites and spreading pathogens between properties.

We often forget that we also play a role in the spread of human disease. This month, we wanted to turn the focus from the animal populations we deal with every day to the human population of which we are part. To illustrate this, we will use the example of influenza in South African people.

It is estimated that 34% of South Africans are infected with seasonal influenza each year and 20% experience symptomatic illness. This represents approximately 10 million people who are affected by influenza each year. The influenza season occurs each year in winter between May and August, lasting for 12 to 25 weeks. According to the Viral Watch respiratory disease surveillance programme, this year's season started at the end of April, peaked in June and has now started to decline (fig 1).

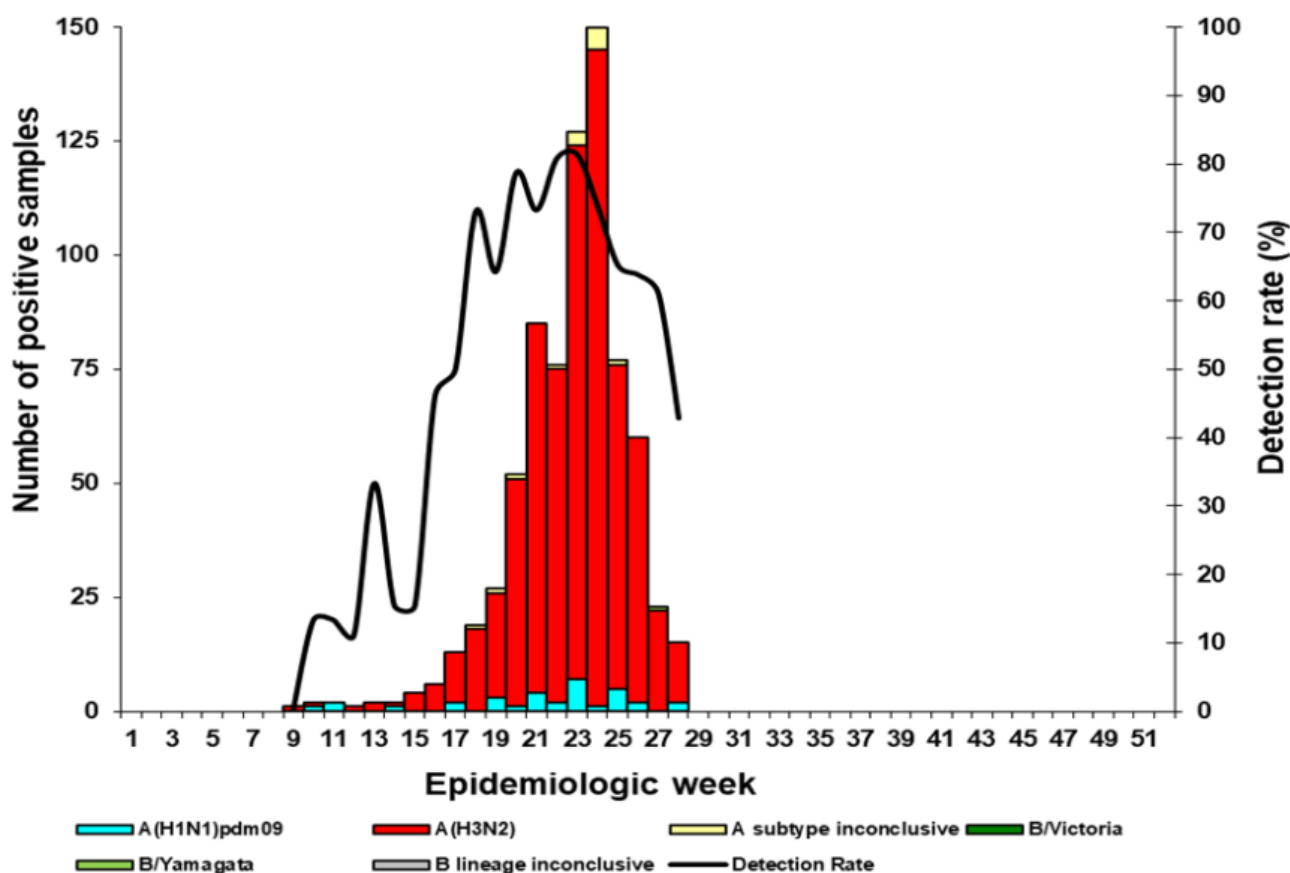


Figure 1: Influenza season in South Africa in 2019 represented by the number of positive samples by influenza type, subtype and detection rate from Viral Watch

(Figure from the NICD Communicable Diseases Communiqué, July 2019, Vol 18(7))

Currently available information indicates that 7-15% of the global human population is infected with influenza each year. In comparison with the rest of the world, the South African rate of infection is therefore very high. This is likely a result of a high rate of transmission of the virus between infected people in South Africa, influenced by human behaviour. It is important, as individuals, to realise that we are not exempt from the rules of disease transmission. It is also important to consider that an illness that is mild for you, may not be for other people to whom you are exposing it.

Of all of the influenza cases in South Africa per year, 128000 people are hospitalised as a result of their illness and approximately 12000 deaths occur. Those at high risk of complications include pregnant women, children, the elderly, the immunosuppressed and those with chronic conditions such as diabetes, heart disease or obesity. Vaccine effectiveness is lowest in these groups of people, so it is important to prevent transmission of the virus in order to avoid severe illness and deaths caused by influenza. Many people who seem otherwise healthy may be suffering from a condition that is not obvious, may be in the early stages of pregnancy or may have high-risk family members at home for whom they are caring.

The control of human disease follows many of the same principles we apply to control animal diseases:

#### **Isolation:**

Stay at home and rest when you are sick (fig 2). Do not go to work or out in public until at least a day after your fever has subsided. Encourage colleagues to stay home when sick. Going to work when sick not only slows down recovery time, but makes one more likely to make mistakes at work as well as infect one's colleagues, causing significant losses in productivity. A study published by researchers from the University of Pittsburgh showed that, by sick employees staying at home for just two days, the number of influenza cases in a workplace could be reduced by almost 40%.

Keep sick children away from school. Children are important transmitters of influenza. Early in the influenza season this year, clusters of disease were reported in several schools. A second peak in the number of influenza cases is also usually seen once children return to school after the school holidays in July.

#### **Early detection and intervention:**

Make sure to rest as soon as you start feeling sick. If you are in one of the groups at high risk of complications, be sure to visit a doctor or clinic as soon as possible to receive treatment if necessary.

#### **Biosecurity:**

If you have no choice but to be in an environment with other people, stay as far away from others as possible (at least two metres). Wash your hands often and clean and disinfect all surfaces you have touched that will be touched by others. Wear a mask over your nose and mouth to minimise the amount of virus you spread into your surroundings.



**Figure 2: Humans and animals alike should stay home when sick to speed up recovery time and prevent transmission of disease to others.**

**Don't try this at home: Use of oral thermometers is not recommended in animals.**

#### **Vaccination:**

Get an annual influenza vaccination, especially if you are in one of the high risk categories. It is best to do so before the start of the season i.e. in March or April, but it is still beneficial to vaccinate later during the season if this is not possible.

#### **General health:**

Keep as healthy as possible by eating a balanced diet, exercising several times a week, getting eight hours of sleep a night and practising stress-management techniques.

#### **References and useful resources:**

The monthly Communicable Diseases Communiqué is produced by the National Institute for Communicable Diseases and provides current information on communicable human diseases in South Africa as well as international disease of importance. The Communiqué can be found at <http://www.nicd.ac.za/publications/internal-publications/>

Kumar et al., 2013, Policies to reduce influenza in the workplace: impact assessments using an agent-based model, *American Journal of Public Health* 103, no. 8, pp. 1406-1411. <https://doi.org/10.2105/AJPH.2013.301269>



# Disease and surveillance

## Disease and Census - July 2019

### Legend

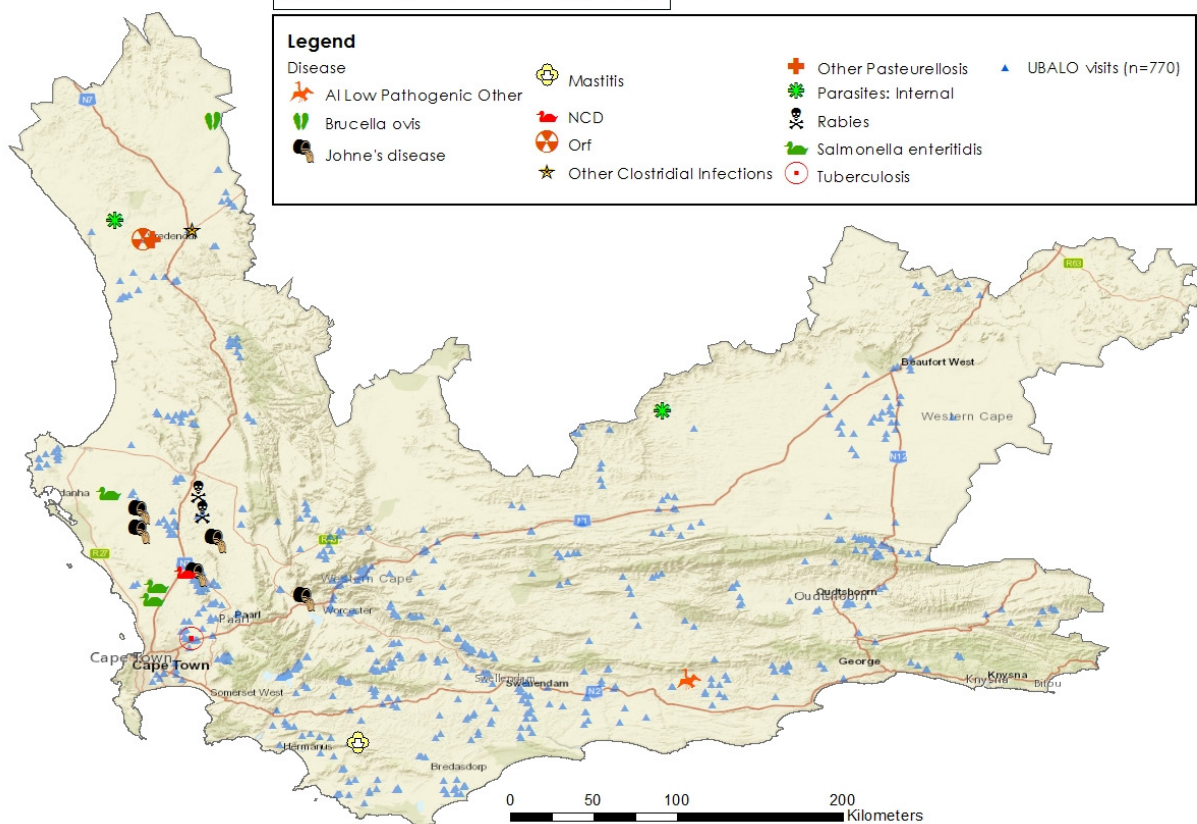
#### Disease

- AI Low Pathogenic Other
- Brucella ovis
- Johne's disease

- Mastitis
- NCD
- Orf
- Other Clostridial Infections

- Other Pasteurellosis
- Parasites: Internal
- Rabies
- Salmonella enteritidis
- Tuberculosis

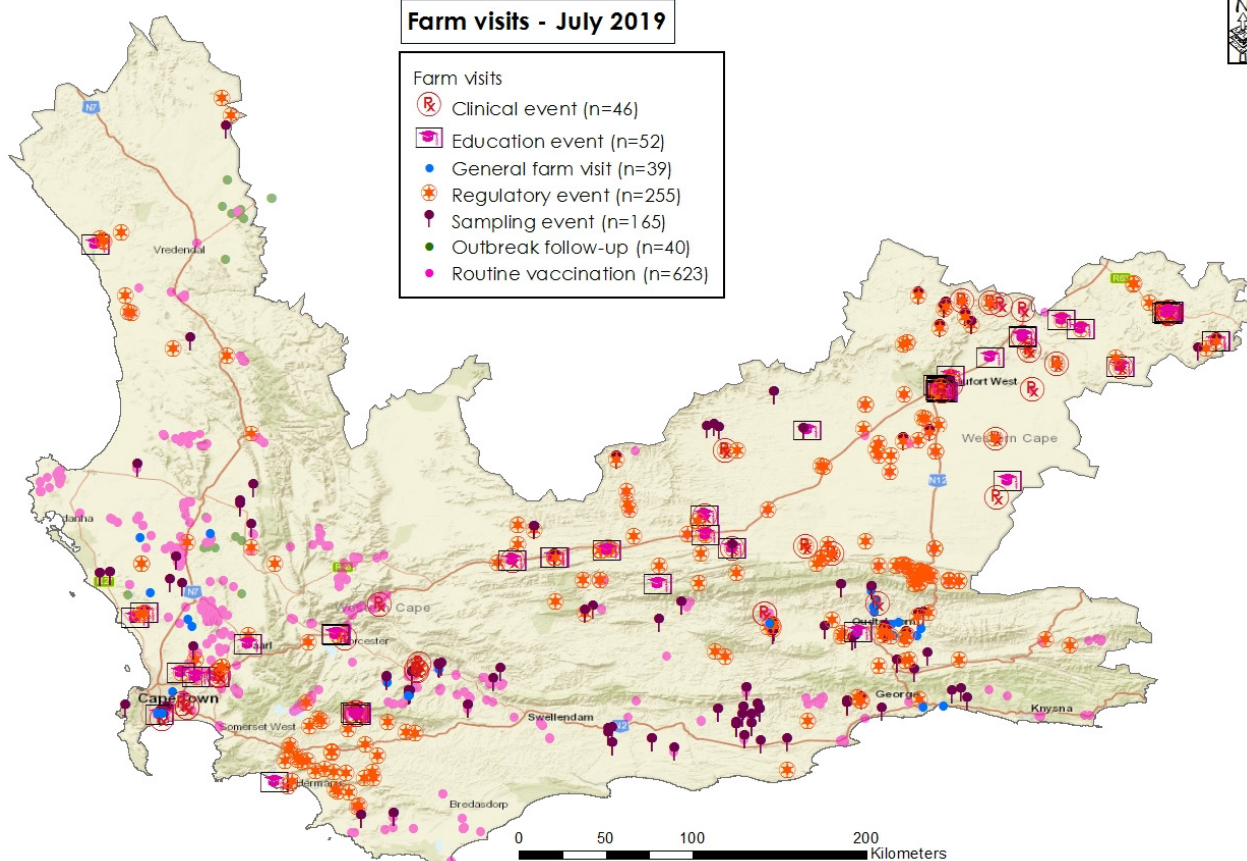
- UBALO visits (n=770)



## Farm visits - July 2019

### Farm visits

- Clinical event (n=46)
- Education event (n=52)
- General farm visit (n=39)
- Regulatory event (n=255)
- Sampling event (n=165)
- Outbreak follow-up (n=40)
- Routine vaccination (n=623)



## Outbreak events

A female tufted **capuchin monkey** at a primate rescue facility near **Cape Town** suddenly started losing weight and was taken to a private veterinarian. Radiographs showed extensive internal organ lesions and so the animal was euthanased. On post mortem, multinodular pyogranulomas were found in several organs. Histopathology of smears of these lesions revealed slender, acid-fast rods in areas of granulomatous inflammation. The person responsible for feeding the monkeys had died earlier this year and it is suspected that this person was infected with **tuberculosis**, which she transmitted to the monkey. All other staff on the premises tested negative for tuberculosis. Further testing of the samples from the affected monkey and of other monkeys in the facility is underway.

**Rabid bat-eared foxes** were reported on two farms in the **Moorreesburg** area belonging to the same owner. On one farm a fox approached the farm house in the early hours of the morning and attacked a dog's bed before being shot by the farmer. The dogs, which had run away from the fox when it appeared, were examined by a private veterinarian and no evidence of contact with the fox was found. The dogs were washed with F10 and vaccinated twice three days apart. On the second property, a bat-eared fox was observed in the fields showing no fear of humans. When the farmer went to investigate the next day, it attacked his vehicle and ran away. It was found later that day and killed. All dogs, cats and horses on the affected and surrounding properties were vaccinated.

**Ostriches** near **Riversdale** tested positive for antibodies to **avian influenza** on haemagglutinin inhibition after being moved from another ostrich farm in the Eastern Cape. Further investigation to identify the responsible virus is underway.

A wild **laughing dove** was found with neurological signs (loss of co-ordination, torticollis and weakness) at the **Malmesbury** state vet office. The dove was euthanased and a brain swab tested positive for presence of **pigeon paramyxovirus**.

**Ovine Johne's disease** was diagnosed on farms near **Worcester, Moorreesburg, Hopfield, Malmesbury** and **Riebeeck West** after farmers noticed a small number of ewes becoming thin over time and dying.

**Salmonella enteritidis** (SE) was cultured from chick-box liners and boot swabs on two broiler **chicken** farms in the **Atlantis** area. SE was also cultured from dust on a broiler breeder rearing farm near **Hopfield**. Birds in the affected houses on all three properties were treated with antibiotics and increased follow-up sampling will be done.

**Brucella ovis** was diagnosed in **rams** in the **Knersvlakte** in the north of the province.

A **sheep** died of **tetanus** near **Vanryhnsdorp** (fig 3).

**Staphylococcus aureus** was identified as the cause of **mastitis** in **cattle** near **Tesselaarsdal**.

Six-week-old **lambs** died of **Escherichia coli** infection on two properties in the **Beaufort West** area.

In **Lutzville**, **lambs** were dosed for infestation with **wireworm**.

Several **sheep** died of **pasteurellosis** in **Vredendal**.

A severe infestation of **liver fluke** was seen in **sheep** near **Laingsburg**.

Contagious pustular dermatitis (**orf**) was seen in five **lambs** in **Vredendal**.



**Figure 3: Stiffness and extension of the limbs as a result of tetanus (J. Kotze)**

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