

Country Report: South Africa

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SOUTH AFRICA has a land area of 1 219 090 square kilometres, divided among nine provinces, with a total population of around 40.5 million distributed in the different provinces. People living outside the cities represent 46% of the total population. A total of five out of nine provinces have a high rural to urban ratio: the Northern Province (90% rural to 10% urban population); Northwest Province (66% rural to 34% urban); Eastern Cape Province (64% rural to 36% urban); Mpumalanga Province (60% rural to 40% urban); and Kwazulu Natal Province (56% rural to 44% urban). One of these provinces, Northern Province, is the poorest of all and could be a good starting point for launching a Newcastle disease (ND) vaccination campaign, followed by assessment of the impact such a campaign will have on the community as a whole.

In South Africa, not a lot of work has been done on village or backyard poultry, for many reasons, including the previous laws of the country (apartheid). A majority of these chickens are owned by people who were disadvantaged or in traditionally black-only areas, and who are also sadly the poorest of the poor, without any access to veterinary or extension services. Large vaccination campaigns have not been launched due to financial constraints and priorities, as these birds are not perceived as playing any important role in the economy of the country. They do, in fact, pose a constant and serious threat to the well-established and developed commercial poultry sector, in terms of disease spread, especially ND, as most of these birds are not vaccinated.

Reasons given for not vaccinating these birds include lack of extension services and information dissemination in these areas. Owners do not know about the different infectious diseases and their control or prevention through vaccination. Consequently, they are often faced with a number of

chickens, or a whole flock dying for no apparent reason. For owners who are aware or knowledgeable about vaccination, the cost is a problem, as vaccines available in the market are made for commercial poultry and vaccines are available in doses for 1000 birds, which is not practical for somebody with 5–10 chickens. Another problem is maintenance of a cold chain, which is a requirement for most of the vaccines in use. This is a practical impossibility as some rural areas are very far from the point of purchase of the vaccine, most owners do not own refrigerators, and in some areas or villages there is no electricity supply at all. Most of these birds are free roaming and catching them for vaccination can be very difficult.

In the majority of households, the men have usually gone to the cities to look for jobs, leaving the women to take care of the household. Worrying about vaccinating the chickens is usually the last thing on a woman's mind, as she has to take care of her children and sometimes other members of her extended family.

A lot of work needs to be done in South Africa to develop and uplift poor communities. People in rural areas or villages are usually very poor, and cannot afford most things, but most own at least 2–5 chickens. These chickens are free-roaming (not housed) and scavenge for food, thus the already limited financial resources are not used for feeding or housing, but in return the household gets meat and eggs from these birds.

Poultry could be the best way to uplift the community, as it is not as expensive to maintain as other livestock such as cattle or goats, and both the eggs and meat can be used as an affordable source of protein.

The private sector (commercial poultry sector) can play an important role, such as donating funds for a large-scale control or vaccination campaign. Not only does the community stand to benefit from this, but the risk of disease spread from rural to commercial poultry will also be reduced.

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Newcastle Disease Outbreaks

Because no work has been done on backyard chickens in the country, statistics have not been collected, and as a result, their total number or an estimate of their numbers is not known. Most importantly, it is not known whether ND outbreaks occur in these areas or not, although there have been unconfirmed reports of chickens dying in large numbers in some of these areas.

ND is a controlled disease, in terms of the Animal Diseases Act (Act 35 of 1984), and the following procedure must be followed in case of a suspected outbreak:

- The Regional State Veterinarian or Animal Health Technician (AHT) should be informed by the owner of the birds, of any suspected disease outbreak. Adjacent landowners must also be informed. If a private veterinarian is involved, it is also his/her responsibility to make sure that the State Veterinarian or AHT is immediately notified of the suspected outbreak.
- The State Veterinarian must in turn notify the Provincial Director of Veterinary Services, initially of the suspected case, then a follow-up of the outcome of the investigation, such as confirmation of the outbreak or not. The Provincial Director of Veterinary Services also conducts an epidemiological investigation, and then reports the findings to the National Director of Animal Production and Health.
- Control measures have to be instituted on the affected property, and these include:
 - Placing the affected property under quarantine (which is only lifted after the outbreak has been successfully controlled, or 21 days after the last outbreak), the quarantine may be extended to adjacent farms.
 - Isolation of the affected birds, with introduction of strict bio-security measures, to prevent further spread, including movement of people, equipment, vehicles, feed,
 - Litter, etc. Nothing is allowed to move off the farm without a permit issued by the State Veterinarian.
 - All birds on the farm and within a 3 km radius must be vaccinated with a registered approved vaccine, making use of the fine spray or eye drop application.
 - Severely affected birds are culled. Culls and mortalities should be properly disposed of, by burial, composting, incineration, or should be moved with a permit in closed containers to an approved rendering plant. Minimal contamination to the environment should always be ensured.

- No trade in poultry products should be allowed, except for movement with permit for direct slaughter at an approved abattoir; transportation should be without stops and along a route where there is minimal risk of diseases spread to other poultry.

Reported outbreaks 1995–1999

Statistics were obtained from the National Department of Agriculture for all the reported outbreaks of ND that occurred from 1995–1999 (Figure 1). It is however questionable if these figures are a true reflection of the ND status in the country, as most of the outbreaks, especially in rural areas, may be going unreported. This could be due to lack of veterinary extension services in these areas, or to the fact that people do not know that it is a controlled disease that should be reported. To some people the loss of five chickens may not seem so important that they have to travel long distances from their villages to report to the nearest State Veterinarian's office. According to the affected owners, it is not of any great significance as they will not be reimbursed for the dead chickens or benefit in any way from reporting the dead chickens. These combined factors contribute to the possible false picture of a low incidence of the disease that is reported in the country areas.

In 1995, 61 outbreaks occurred throughout the country. An outbreak is considered as any confirmed disease report in a certain area or particular farm. A large number of birds may be affected in one reported outbreak, e.g. 2 million chickens may die from one reported outbreak in a single farm. The incidence decreased in 1996 and 1997, when only 31 and 21 outbreaks were reported successively. There was a major disease outbreak in 1998, when 85 outbreaks were reported and millions of chickens died, but the incidence decreased in 1999 to only 33 reported outbreaks. These figures mainly refer to commercial poultry, where there is constant vigilance, with efficient and rapid reporting and control of disease outbreaks.

Monthly occurrences of ND

Statistics obtained from the National Department of Agriculture were studied to determine if there was a monthly or seasonal pattern of disease outbreaks (Figure 2).

In 1995, ND was more prevalent in the first half of the year, from January to June, whereas in 1996, it was mainly in August and October. In 1997, disease occurrence was more uniform throughout the year, with peaks in January, April, June, July and October, whereas both in 1998 and 1999, disease occurrence was more prevalent in the second half of the year,

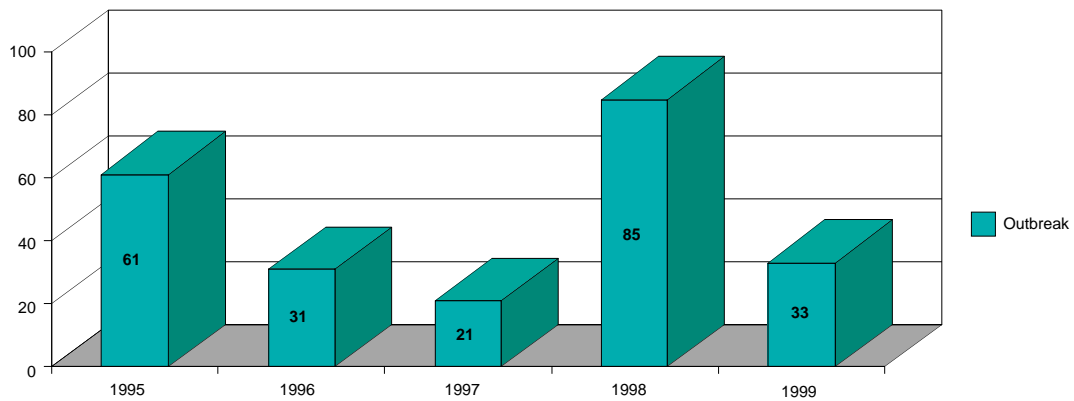


Figure 1. Reported ND outbreaks between 1995 and 1999.

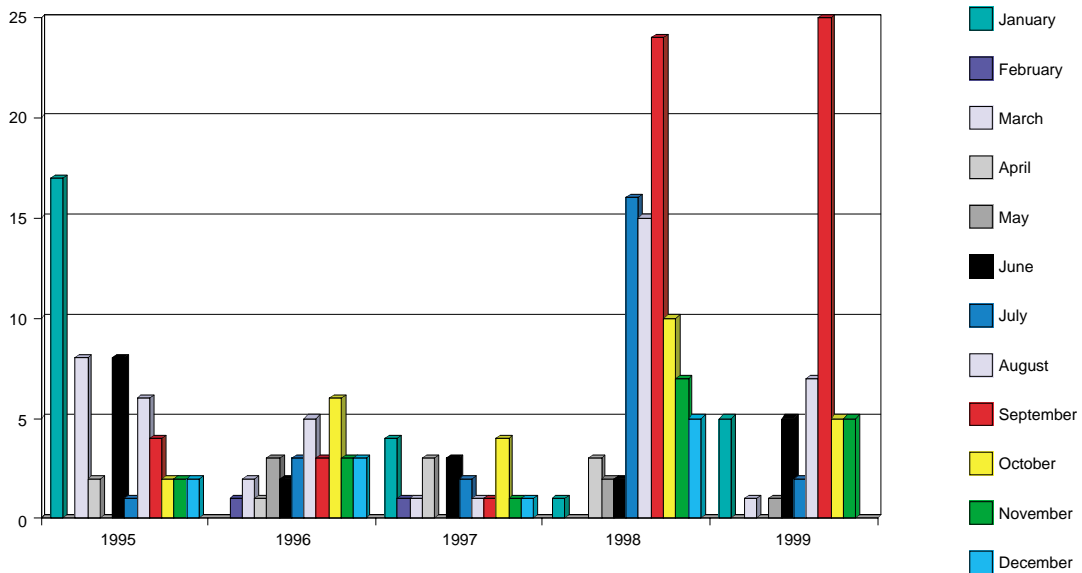


Figure 2. Monthly prevalence of ND from 1995 to 1999.

from June and then tapering off in November. For both these years, September recorded the highest number of outbreaks, coinciding with the beginning of spring. It is also very windy at that time of the year; therefore, the high incidence of ND could be due to windy conditions, resulting in its easy spread from one farm to another.

These findings are very interesting and coincide with findings from other SADC countries, where high disease outbreaks were reported especially around September. In the different SADC countries,

September is reported to be the dry season and also harvest time, with increased farm activities, movement and mixing of people from different areas. These factors are thought to be among the reasons for high disease occurrence around that time.

These factors, however, do not apply to South Africa, as most of the outbreaks reported are from the commercial sector. The environment in this sector is strictly controlled, and mixing of workers from different farms is not allowed, and even the mixing of workers or movement from one poultry

house to another on the same farm is restricted. Wind seems to be the only important factor that may be playing a role in the spread or increased occurrence of disease around September.

ND Vaccines Used in South Africa

Both live attenuated and inactivated vaccines are in use in the commercial poultry sector. The live attenuated strains in use include the avirulent Ulster and V4 strains, the lentogenic Hitchner B1 and mainly cloned La Sota strains (clone 30), together with the mesogenic Komarov strain (C. Pienaar, pers. comm. 2000).

Research and Development

The main sectors involved in this area are the Onderstepoort Veterinary Research Institute (OVI) and the Veterinary Faculty of the University of Pretoria (Onderstepoort), which also acts as a Poultry Reference Laboratory.

There are two main departments involved at the OVI. The Animal Health for Developing Farmers program (AHDF), was started in April 1998, with the specific aims of:

- developing appropriate and relevant information modules on animal health to empower resource-poor farmers (RPFs) to recognise, prevent and treat diseases in their livestock;
- training extension staff working with RPFs on animal health issues; and
- identifying research priorities in animal health for RPFs and initiating research projects. (J. Turton, pers. comm. 2000)

The other department involved is the Department of Molecular Biotechnology, which is mainly involved in research and diagnostics. Among the

research projects, those of interest include the development of a heat stable ND-DNA Vaccine and also a ND-Fowl Pox recombinant vaccine. These may be more suitable for use in the already well-developed and established commercial sector, but a cheaper alternative still needs to be found for village or rural poultry.

As far as diagnostics is concerned, the Department of Molecular Biotechnology has developed a polymerase chain reaction (PCR) diagnosis for ND, based on a publication by Kant et al.1997. This accords with the new definition of ND approved by the OIE International Committee, in the OIE working document on ND (OIE 2000), which states:

1. The virus must have an intra-cerebral pathogenicity index (ICP) in day-old chicks of 0,7 or greater.

Or

2. Multiple basic amino acids have been demonstrated in the virus (either directly or by deduction) at the C-terminus of the F2 protein and phenylalanine at residue 117, which is the N-terminus of the F1 protein. The term 'multiple basic amino acids' refers to at least three arginine or lysine residues between residues 113 and 116. (OIE 2000)

References

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- OIE 2000. Meeting of the *Office International des Epizooties* Ad Hoc Group on Newcastle Disease, Paris, 18-20 April.
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