

# A history of bovine tuberculosis eradication policy in Northern Ireland

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## SUMMARY

Despite many years of state-sponsored efforts to eradicate the disease from cattle through testing and slaughter, bovine tuberculosis (bTB) is still regarded as the most important and complex of animal health challenges facing the British livestock agricultural industry. This paper provides a historical analysis of the ongoing bTB statutory eradication programme in one part of the UK – Northern Ireland (NI) – which began in 1949 as a voluntary scheme, but between 1959 and 1960 became compulsory for all cattle herd-owners. Tracing bTB back through time sets the eradication efforts of the present day within a deeper context, and provides signposts for what developed in subsequent decades. The findings are based primarily on empirical research using historical published reports of the Ministry of Agriculture and state documents held in the public archives in NI, and they emphasize the need to consider the economic, social and political contexts of disease eradication efforts and their influences on both the past and the present.

**Key words:** Archival research, bovine tuberculosis, disease eradication, history, socio-economics.

## INTRODUCTION

Bovine tuberculosis (bTB) is a zoonotic disease of cattle and other mammals with a global distribution. European Union (EU) legislation requires eradication of the disease from all Member States, primarily to facilitate the international trade of animals and animal products, but also to protect human health. All cattle in Northern Ireland (NI) aged >6 weeks are tested at least annually using the single intradermal comparative cervical tuberculin (SICCT) test in a comprehensive eradication programme, but bTB remains an intractable and expensive problem, albeit occurring at a much lower incidence than in the past.

The research presented in this paper is based primarily on archival research in state archives in Belfast, NI, conducted as part of a wider ethnographic study of bTB eradication in NI involving interviews with key actors involved in the programme in the present. Using monthly state agricultural reports and archived NI Civil Service files, the aim was to provide context for the current situation using the documented records of the past. Examining the history of disease eradication efforts is an important part of understanding and contextualizing the present [1–3], and all the more important given the paucity of historical knowledge among the actors interviewed in the wider ethnographic study; much knowledge has been lost or forgotten given the passage of time since the programme began. Although previous authors have considered various aspects of the history of bTB policy in Great Britain [1, 4–6], this paper is the first to analyse the eradication efforts in NI. The paper therefore provides a broad sweep of bTB eradication policy in NI,

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starting in the 1930s, but with a particular focus on two particular decades – the 1950s and 1970s. The 1950s demonstrate that strong economic incentives combined with later statutory legislation ensured farmer participation in the eradication programme. The 1970s represent arguably a key turning point in the programme when the goal of eradication seemed to be confidently within sight, only to slip from the grasp of the state.

## BEGINNINGS

Recognizing bTB as a significant animal and human health problem, efforts to eradicate bTB in NI began before World War II, mirroring similar efforts in Great Britain (GB). For example, the Bovine Tuberculosis Order (NI) of 1926 and Milk and Dairies Act (NI) of 1934 followed the same legislative adoptions in GB in 1925 and 1934, respectively. From 1 April 1935 the Bovine Tuberculosis (NI) Order, 1935, required farmers in NI to report suspicion of bTB in their cattle to the police, who in turn passed on the information to the Veterinary Inspector for the area. Likewise, private vets who suspected bTB were also required to report their findings. After clinical inspection by a Ministry of Agriculture vet, cattle deemed to be affected by bTB were valued at market value for state compensation. Restrictions were also placed on the milk of such animals until they were compulsorily slaughtered. Between 1942 and 1947 an average of more than 400 clinical cases of bTB were slaughtered per annum under the Tuberculosis Order [7]. Kerr *et al.* [8] reported an incidence of 33% in 600 dairy cows examined in NI between 1945 and 1948, and 7.5% of milk churn samples were found to contain tubercle bacilli, illustrating the public health risk from drinking unpasteurized milk. The disease was also regarded by the state as one of the most serious causes of economic wastage in the livestock industry, with many affected animals being culled and sent to knackeries, or to slaughterhouses, where they accounted for around 80% of meat condemned as unfit for human consumption [7]. Clinically affected animals were recognized as ‘poor doers’ that lost weight, became progressively thinner, and eventually died. Progress was made in removing such animals from the national herd, and in Reilly’s opinion [9] there had been a marked decline in the number of cases of human tuberculosis of bovine origin in NI by the 1940s for three main reasons: milk pasteurization; education of the public about the risks from

drinking unpasteurized milk; and the detection of bTB through the tuberculin testing of cattle.

A voluntary eradication scheme based on cattle testing and administered by the state began on 2 May 1949. Intended to operate for an initial period of 5 years [10], it was known as the ‘Tuberculosis (Attested Herds) Scheme’, and at that time the animal bTB incidence was about 25% [11]. By January 1951 the Ministry of Agriculture’s Monthly Agricultural Report stated that ‘herd owners [were] becoming increasingly aware of the benefits which [the scheme] offered’, and 400 had signed up to it [12]. It consisted of the voluntary tuberculin testing of all cattle in the farmer’s herd with the disposal (but not slaughter) of positive (‘reactor’) animals, and subsequent regulation of animals moving into the attested herds. The scheme began with great confidence in a successful outcome, and the Ministry at this early stage confidently declared that ‘it is now apparent that tuberculosis in cattle is a disease which lends itself to practical control measures’ [12]. Furthermore, ‘in most instances, the will to tackle it [was] all that [was] needed to achieve that result’ [13]. Designed to establish herds officially certified free of bTB, the scheme provided financial assistance to farmers to achieve that status through testing, and a bonus of 30 shillings (£1.50) per year for each animal in the herd thereafter for 3 years, provided the herd remained bTB-free [12]. The basic tenets of the 1949 bTB eradication policy – tuberculin tests, removal of reactor animals, financial compensation, movement controls, and the cleansing and disinfection of infected premises – remain essentially unchanged to the present day.

Throughout the 1950s the Ministry reported the progress of the voluntary scheme in its monthly agricultural reports, and sought to persuasively argue the benefits for farmers to join, particularly emphasizing the economic cost of bTB presence on farms. In June 1952 the report suggested that bTB was ‘sapping the resources of [NI] at a rate which is of vital concern to all’ [14]. This annual cost to NI was estimated at £800 000 through the condemnation of 2000 tonnes of meat, and an estimated 10% reduction in milk yield from infected cows [14]. Elimination of this ‘needless wastage’ would result in increasing personal profit, and to further encourage enrolment, many farmers were said to have reached attested standard ‘with remarkable ease and with little or no disturbance of their farming economy’ [14].

Introducing the rules of a new attested herds scheme to begin later in the year on 1 September 1954, new arguments were used to encourage the eradication of bTB from NI [10]. The USA and Denmark were cited as examples of countries which had successfully eradicated bTB through test and slaughter. Slaughtering reactors at this stage of the NI eradication programme was not deemed to be economically viable, but was planned to occur later in the programme when the incidence had been reduced substantially. The fact that reactor animals were being brought to market and sold, rather than being slaughtered, was a definite weakness in the early stages of the scheme. Although the 1949 scheme was believed to have fulfilled its purpose by providing a 'solid foundation' for future expansion, by March 1954 only 5% of the total cattle in NI were in attested herds, and there was 'still much to be done before the scourge of bovine tuberculosis [could] be said to be mastered' [10]. Significantly, the need for urgency was emphasized due to the progress being made in GB, and the contrasting lack of progress in NI, warned the Ministry, was potentially jeopardizing the marketing and sale of beef cattle to GB [10]; this was to become a recurrent refrain in future years. With the new 1954 version of the attested herds scheme, even greater financial incentives were promised, including bonus payments of 30 shillings per animal per annum for 6 years after attestation (rather than 3 years) or alternatively 1½ pence per gallon (4.5 l) of milk for 6 years [10]. Existing attested herds were included within the financial largesse of the state, having their payments extended to encourage ongoing compliance in return for rule and record keeping.

This incentivised policy seemed to work well, and between September and December 1954 the number of new applicants to the scheme increased from only 30 per month to over 100, but the state suggested additional, more important, reasons for the higher rate of take-up [15]. These included the realization among farmers that the production losses caused by bTB presence in their herds was unsustainable, and also that attested cattle were fetching at least £10 more per head at market. Special sales of attested cattle were by now distributed across the country, with demand reported to be encouraging, but once again warnings were issued about the potential loss of trade with GB: 'It is absolutely vital that NI farmers should establish an adequate reservoir of attested store cattle to supply the needs of the Cross-

Channel market, before that market is lost to this country' [15].

## EXPORT MARKETS UNDER THREAT

There had been a substantial and longstanding tradition of exporting live cattle from Ireland to GB, and this was greatly facilitated by the introduction of the railways and steamships for speedier and more economically viable transport [16]. For example, 16 million cattle were exported between 1878 and 1900 at an average of 700 000 head per year [16]. Jones [17] notes the impact of the cattle trade from Ireland (both north and south) to GB on bTB eradication efforts, and she argues that the need to protect this trade and prevent the closure of a key export market was a key driver for legislative change in both parts of Ireland. The legislation in Britain therefore 'pulled up agricultural and sanitary practice in the Free State [Republic of Ireland; ROI]' [17], and the same could be said for north of the border. As the monthly agricultural reports suggested, this put considerable pressure on both the Northern and Southern Irish veterinary authorities and the cattle industry to act as it raised the prospect of GB prohibiting the import of cattle from Ireland. Jones [17] points out that 'the decision in Britain in 1950 to extend the Attested Herds Scheme concentrated minds'.

The angst about exports certainly intensified as the 1950s progressed, and on 8 May 1957 Mr Minford, a Member of the NI Parliament at Stormont, raised his concerns about the potential loss of export trade given that the ROI was experiencing 'semi-paralysis' in its exports to GB [18]. With Scotland around 85% free of bTB, and with hopes for the rest of GB to be bTB-free by 1960 or 1961, the pressure was on the Northern Irish cattle industry to move more speedily towards eradication [18]. By August 1957 around 350 applications per month were being received, but this meant that still only a quarter of the cattle in the country were in the scheme [19], and on 12 November 1957 a further debate in Parliament heard the Minister for Agriculture (Rev. R. Moore) announce his intention to seek parliamentary approval for prescribing areas for the complete eradication of the disease by the compulsory slaughter of bTB reactors with state compensation in early 1958 [20]. This political announcement was discussed in the January 1958 Monthly Report and used as an ominous warning that those farmers who were still outside of the Attested Scheme may have 'let slip the

opportunity which [had] been there since 1949' to participate with generous financial bonuses, but who now faced compulsion with the prospect of only compensation for reactor animals [21]. The report suggested that with time running out, 'there [was] only one wise course open to farmers who do not want to be the losers', and that was to apply and reach attestation as soon as possible [21]. That month's report also noted the intense pressure which Ministry vets were under to keep up with the increased numbers of herd tests, which, combined with simultaneously dealing with a swine fever outbreak, had forced the Ministry to change the scheme rules to allow private veterinary practitioners to conduct official bTB herd tests [21]. The state became increasingly dependent on the role of private vets to maintain the scheme's viability, but as we shall see later in this paper, this relationship turned sour in the 1970s.

Despite definite progress, the take-up of the scheme in NI needed to dramatically gather pace. With over 116 000 store cattle shipped to GB in 1956, and 138 000 the following year of 1957 worth an estimated £7 000 000, [21] there was a very strong economic argument for eradicating bTB to maintain the flow of cattle across the Channel. On 31 October 1958 Mr John N. Ritchie, Chief Veterinary Officer (CVO) for GB, gave the George Scott Robertson Memorial Lecture at Queen's University, Belfast, and spoke to the title 'Britain's achievement in the eradication of bovine tuberculosis'. In this lecture he spoke of the demand for store cattle in GB, but hinting that isolation and re-testing after import would no longer be acceptable, he warned his Northern Irish audience that: 'It is necessary to make sufficient advancement in eradication to ensure that these store cattle have reached a standard of freedom from infection which will justify their unconditional entry into herds in Great Britain' [22]. As Watchorn [23] put it: 'The day was therefore coming when all Irish store cattle exported to Britain would have to be of attested status'. Having had a voluntary bTB Attested Herds Scheme since 1950, by 1959 95% of cattle in GB were in attested herds [17]; NI needed urgently to match those standards of disease freedom.

By May 1959 attitudes appeared to have changed, and there was now a 'flood of applications' to join the scheme, with 55% of the cattle population of NI involved [24]. The farming community were reported to have responded with great enthusiasm, and in the opinion of the Ministry, 'their co-operation and goodwill has been of the greatest assistance in pursuing the

campaign' [24]. The lack of vets (both Ministry and private) to conduct the ever-increasing number of tuberculin herd tests was regarded as the limiting factor on the on-going progress towards the goal of eradication [24]. This lack of testing manpower was a recurring theme echoed by state veterinary officials into the 1970s.

Compulsory eradication began in Counties Antrim and Londonderry from 1 September 1959, and the other four counties of NI were to follow down the eradication path on 1 January 1960 [25]. With the state now forcing the slaughter of reactor animals with compensation at market value, 721 of these cattle were slaughtered in the first 6 weeks of operation of the compulsory eradication area in Antrim and Londonderry, and subject to passing meat inspection, were deemed fit for human consumption [26]. The Diseases of Animals Act (NI) (1958) provided the legislative authority to enforce the compulsory eradication of tuberculosis, and although all herd owners were therefore forced to comply by law, the Ministry was keen to praise the farmers for their cooperation: 'In the ten years of its life the scheme has gained the most surprising degree of support from the farming community, to whom all honour is due for their efforts' [27]. This praise came with an exhortation: 'Herd owners and all others concerned are reminded once more that it is in the interests of NI that the eradication programme should be completed at the earliest possible date and that faithful observance of the rules is essential' [27]. Eradication was therefore explicitly connected to rule-keeping, and there appeared to be optimism about a successful conclusion to the programme. From the beginning of 1960 no untested bovines were permitted to enter NI from the ROI [27], and in March 1960 the remaining areas in GB were brought under compulsory bTB eradication, resulting in imports of untested cattle from the ROI being banned. The export trade of store cattle from the ROI 'hit bottom' [23]. With the system of testing, valuation and removal reported to be 'working smoothly' in NI, the Ministry was optimistic that the target of all herds reaching attested status would be reached before the end of 1960 [28].

At the end of May 1960, 898 946 cattle (93% of cattle in the country) were either fully attested or on their way to achieving attested status, and all herds in NI had been tested at least once [29]. NI was declared an 'Attested Area' on 25 November 1960 [30], meaning that bTB had been reduced to very low levels. Such was the confidence in the progress made, the

Minister for Agriculture confidently stated in April 1962 that apart from the need for ongoing annual testing, the problem of bTB had been ‘substantially dealt with’, and the state’s attention had instead turned to eradicating another zoonotic disease problem – bovine brucellosis [31].

Given the rapid progress made towards eradication in the early 1960s, the herd testing regime was changed from annual to biennial in 1965, and further reduced to triennial herd testing in 1971. According to Russell [30], ‘eradication proceeded smoothly from 1949 to 1971’, and likewise Chalmers [32] stated that bTB eradication was ‘initially a straightforward exercise and rapid progress was made’. In fact, so successful were the first two decades of the programme that bTB was thought to have been ‘virtually a thing of the past’ [30] by the early 1970s. But hopes of having conquered bTB were raised only to be later dashed. Using the memoranda, minutes of meetings, and internal letters of state veterinary and animal health policy officials in the 1970s [33] one can trace the rising concern about a changing scenario in the 1970s when progress towards eradication became instead regress towards entrenchment. Recurring themes emerge from the archives which replicate many of the debates of the present. They are discussed in what follows in largely chronological order, unfolding a narrative of bTB eradication gone wrong, with the state struggling to govern the messy realities of bTB in the field.

### HEADING IN THE WRONG DIRECTION – THE EARLY 1970s

In a memorandum dated 30 March 1972 [34] the CVO Mr Edwin Conn (CVO from 1959 until 1983) sagaciously stated that ‘from time to time we must take stock and see how work is progressing’. He had noted reports of an increase in bTB skin reactors and bTB-lesioned animals across NI, but thought that it had not yet reached ‘worrying proportions’. He was however ‘anxious to ensure that the seeds of a problem are not being sown’ [34]. Progress towards eradication appeared to be in reverse for the first time. Rumours were circulating about the standard of testing by vets, and the CVO speculated that ‘[skin] measurements are not being taken at both visits’, and emphasized that ‘the necessity for such measurements to be carried out cannot be overstated’ [34]. He asked that both Veterinary Officers (VOs) and private veterinary practitioners (PVPs) be reminded of the need to

accurately conduct the tuberculin test, especially with a view to reducing the number of bTB reactors before the impending UK entry into the European Economic Community (EEC) in 1973.

Three years later, while reflecting on the increasing incidence of bTB in the previous years, a state vet suggested in June 1975 that there were a number of reasons for the trend [35]. First, after the introduction of biennial testing in 1965, there had been an increase of bTB to 1967, but this had subsequently decreased. On the same reasoning, he suggested there could have been an increased incidence after the introduction of triennial testing in 1971. Second, he mentioned that the national cattle herd was increasing in size, and that there was intensification in the husbandry required to manage this increase in numbers. Third, some blame, he suggested, was to be attached to the interpretation of tuberculin tests by vets in Divisional Veterinary Offices (DVOs) which he thought had been too liberal. Similarly, PVPs in the field had been classifying animals as inconclusive rather than positive to the test, allowing truly infected animals to remain longer on-farm than was necessary. Fourth, cattle imported across the border from the neighbouring ROI were deemed to be important due to their higher incidence of disease. The official concluded that there needed to be monitoring of the standards of testing, and that biennial testing needed to be reconsidered rather than triennial if the 1975 incidence figures remained high [35]. In other words, the recommendation was made that the governance of bTB, and specifically vets and cattle, needed to be improved.

Following the significant deterioration in the bTB situation through these early years of the 1970s, a written request was made to the Department of Finance on 12 December 1975 to ask for financial provision to be made to cover the cost of reverting from triennial to biennial testing to begin on 1 April 1976 [36]. Several reasons were given for the deteriorating situation, and to justify the change in testing regime, echoing earlier conclusions and calls for change. First, there had been difficulties in recruiting enough vets to fill the authorized complement for Department staff over the previous several years, and this difficulty was mirrored in private practice. As a result the testing programme had fallen behind, and by November 1974 there were 7560 overdue herd tests. The combination of triennial testing and the backlog of overdue tests meant that some herds were not being tested for up to 4 years, allowing ample time for within-herd spread of infection.

Second, given the substantial number of cattle imports into NI from the ROI, there was serious concern about the high levels of bTB south of the border. Attempts since May 1973 to impose a pre-export test for imports from the ROI had thus far failed due to political opposition, but it was now going to be imposed. To worsen the situation, there had been no testing in the ROI in the 6 months previous due to a dispute between veterinary practitioners and the Irish state. Additionally, imported store cattle (young beef cattle bought for further fattening) were often slaughtered or moved before they could be tested, and along with the long test intervals, these factors concealed the true scale of the problem. Third, there were factors connected to cattle demographics within NI. There had been a marked increase in cattle numbers in the early 1970s, with a 25% increase in total number of cattle and herd size between 1972 and 1975. There was also said to be a ‘massive’ movement of cattle between these herds. Changing the testing regimen was to prove costly: reverting back to biennial testing was estimated to cost an additional £150 000 on top of the £180 000 already being spent per annum to pay PVPs for testing, but the letter concluded that there was no alternative:

Failure to take such action would undermine the substantial government investment already made in the tuberculosis eradication programme. This would have very wide implications for the whole agricultural industry and in an EEC context could result in the necessity to pre-movement testing and biennial herd testing [36].

A meeting was held on 10 March 1976 to further discuss bTB policy [37]. The CVO expressed concern over the increase in bTB incidence, especially in 1974, and he outlined the main reasons why he thought this had occurred. These repeated the earlier concerns, and also suggested poor quality testing by practitioners and inadequate attention being paid to test results by overworked DVO staff. He acknowledged that from 1972 the emphasis had been placed on brucellosis control, with bTB no longer regarded as a problem. Farmers were also blamed for not presenting all of their stock for tests. Movement of stock was seen to be a significant means of spread between herds, but the high stocking densities on grazing land was also mentioned, with no resting of pastures possible. Another official suggested that ‘increased frequency of testing on its own was not sufficient’ and this had significance for the proposed reversion to biennial testing. The new tuberculin test, using bovine tuberculin

rather than human, had been introduced the previous year on 1 March 1975, and the after adjustments the specificity of the test was now more appropriate in identifying truly infected animals. Department staffing issues were again to the fore, with lay staff being diverted onto brucellosis control rather than checking animal isolations and the cleansing and disinfection of infected premises, and there was a failure to conduct proper epidemiological investigations of breakdown herds. Department vets were to be ‘exhorted . . . to better and more detailed efforts’ and more veterinary staff were to be recruited. One official concluded that ‘the Department had failed in its responsibility to provide an adequate Veterinary Service’ in struggling to cope with two troublesome cattle diseases – bTB and bovine brucellosis – simultaneously [37]. In a later memorandum [38], a state policy official controversially suggested to the CVO that non-veterinary Department staff should be used to conduct lay bTB testing to cope with the veterinary manpower shortage. This theme which was further discussed in subsequent meetings in the 1970s, and one to which attention returned 40 years later with state trials of lay bTB testing strongly criticized by private vets.

## MATTERS OF CONCERN

A meeting in May 1976 provided further updates on the situation [39]. The CVO noted the overall bTB situation was ‘potentially serious’ and ‘it was giving cause for concern’. Infection was springing up in new areas, and the situation in one division continued to be especially troublesome. More testing by itself was deemed not to be the solution, and a system of permitting animals from affected areas and the possibility of pre-movement testing were discussed as additional policy changes. There were also increasing reports of testing ‘not being carried out properly’, and the CVO said that some vets had been removed from testing, and ‘every effort was made to detect misdemeanours’. A senior official had travelled around NI and met with vets to ‘re-educate’ them about bTB testing. The issue of a vet testing their own client’s herd was raised, suggesting either direct or indirect pressure from herd owners on vets to ensure a test without reactors being declared, but the CVO suggested there would be opposition to changing the *status quo*. The minutes further record that:

Veterinary Division representatives were unanimous in their opposition to the suggestion of employing lay staff on TB

testing and were of the opinion that this would be most strongly opposed by the RCVS [Royal College of Veterinary Surgeons – the governing body for vets in UK] and could lead to serious trouble [39].

The CVO felt that there was no case for lay staff and believed that more veterinary staff was the solution, but presciently ‘indicated that he would not go so far as to say that this would never come’. The intended future direction of the CVO was summed up in the closing minute: ‘Veterinary Division was pinning its faith on more testing, more frequent testing, import controls, more policing by lay and professional staff, and a close study of herd breakdowns’ [39].

In response to this meeting, Mr Chalmers again wrote to the CVO 2 weeks later [40]. Chalmers began by stating that he had an ‘increasing concern that we may not be tackling TB as effectively as we could with our attainable resources’. He criticized the CVO’s stance that the situation was ‘*potentially* serious [emphasis in original]’, and in his view this ‘would tend to under-state its immediacy’ [40]. Using statistics on disease incidence to support his argument he suggested that the disease had been ‘increasing exponentially’ since 1971. Although the initial cause for concern in 1972 had been the Coleraine divisional area, between 1974 and 1975 the incidence of the disease had trebled in the rest of the Province. The agreed measures from the policy review meeting had been extra policing and enforcement; ‘re-educating’ PVPs; biennial testing rather than triennial; further import controls; and further epidemiological investigation of breakdown herds. But Chalmers launched a devastating critique of these measures. He pointed out that ‘re-educating’ PVPs had failed to achieve better results in the past, and he saw no reason for it to work now. He did not hold out hope for biennial testing, as shorter-interval 10-monthly testing had failed to achieve results in Coleraine division. He suggested that eradication could be achieved through centralized control rather than the current arrangement of decentralized management through the divisional offices. He challenged the Veterinary Division’s opposition to close supervision of PVPs, despite their view that ‘a number of rotten apples’ among vets had been responsible for the high levels of disease in certain areas, and was strongly in support of the introduction of lay testers to overcome the veterinary staff shortages for testing and the view that the ‘control of private practitioners presents difficulties’. His conclusion

was damning, and perhaps could be described as prophetic:

I am bound to say that I feel our chances of getting a grip on the disease without taking measures substantially more radical than those we agreed at our meeting are not very great ... I have the feeling ... that we may have deployed a nut to obstruct the progress of a steamroller! [40].

Chalmers believed that the staff shortages would continue as vets were in short supply, and were unlikely to be attracted into the Department given restrictions on government expenditure. To gain perspective on this shortage of vets, Connolly [41] reported that there were 130 vets in private large animal practice in 1966, compared to around 300 in 2013 [42], with an increase in the total cattle population of just 25% in the intervening period: the numbers of cattle to be tested per vet would indeed have been challenging. Earlier reports in mid-1975 had lamented that there were 25 vacancies in private practice which could not be filled, and that the Department had also been operating significantly under-capacity, at least 25 vets short of a full complement [43]. Chalmers concluded his May 1976 memorandum by accepting the personal difficulty for the CVO in the matters that he had raised, but felt that in not raising them he would have been ‘shirking [his] proper responsibilities’ [40]. Not all were therefore in agreement with the CVO’s outlook on the way ahead, and there was dissension within the ranks.

The way forward on bTB was proving troublesome. Governance of the disease had by the mid-1970s become a difficult and demanding challenge, and finding a scapegoat would probably have been welcomed by state officials. Badgers, so much the subject of controversy in epidemiological and political debates on bTB in the present day, were first mentioned in the Department’s documents in October 1976 [44]. The first badger to be discovered as bTB-positive had been found in Gloucestershire in England in April 1971 [45], and the role of badgers as possible carriers of bTB was probably on the minds of Department officials. Fifty badgers had been examined in NI, but just one was found to have generalized TB. The significant conclusion was drawn that badgers ‘should not be regarded as a primary cause of herd breakdowns’ [44]. In a further memorandum from April 1977 [46], the results of more badger post-mortem examinations were reported: from 80 post-mortems just three were found to have lesions consistent with bTB. Based on these samples, the disease

certainly did not appear to be widespread in the badger population of NI in the 1970s, but the sampling regime is not specified. In contrast, by this point bTB had now spread right across the cattle population of NI, rather than being confined to a few troublesome areas. In a telling conclusion to the memorandum it was stated that ‘a great deal more effort – right across the board – will be needed if bTB is to be eradicated’ [46]. Towards the end of 1977 there remained issues about a lack of veterinary staff, and this was said to be preventing a move from biennial to annual testing [47], but this change took place in July 1982 when the routine herd test interval was reduced from two years to one in a return to the position of 1965.

### **A DETERIORATING PICTURE: POST-1985 TO THE PRESENT**

The return to annual testing in 1982 appeared to have some effect, for herd incidence reduced to 1.25% in 1987, the lowest it had been since 1973–1974, but from 1988 onwards the levels of bTB rose sharply once again (Fig. 1), prompting a Departmental review of policy in 1990 [11].

The policy review panel concluded that the main causes of the rise in the late 1980s, and echoing the earlier concerns of the previous two decades, were as follows: ‘excessive’ movement of animals; imports from the ROI (both legal and illegal); ‘leakage of infection’ from the ROI; inadequate fencing allowing contact between herds; ‘a lack of knowledge on the part of farmers about the disease’; and ‘the tendency of some farmers to delay or even actively obstruct the testing of animals’. The 1990 review also indicated that ‘the poor performance of a minority of private veterinary practitioners in carrying out tests may have contributed to infected animals not being identified’ [11].

The Department introduced an ‘enhanced eradication programme’ in January 1992, with the aim of reducing animal incidence to 0.06% by 1995, but it was noted that this depended on cooperation from the ROI in substantially reducing their disease level [11]. The actual animal incidence level in 1995 was 0.22%; the target had been missed, and disease incidence continued to rise seemingly inexorably thereafter. After the major foot and mouth disease (FMD) outbreak in 2001, when all bTB testing had been suspended and all resources diverted to dealing with FMD for a period of several months, herd incidence reached a peak of 9.93% in 2002, before

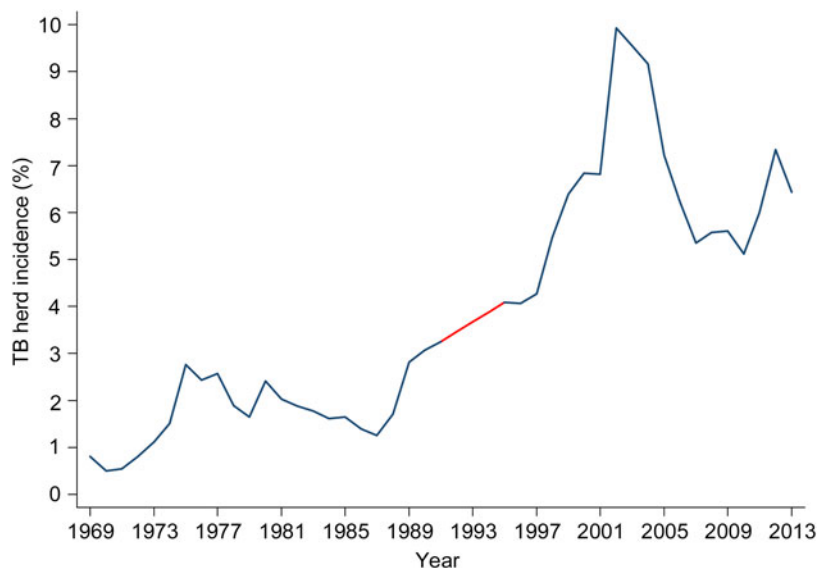
reducing and then rising again to reach 6.44% in 2013 (Fig. 1). Considering that the herd incidence level had been reduced in NI to 0.50% by 1970, these figures may not make comfortable reading for those charged with eradicating bTB. On 13 September 2013 Minister Michelle O’Neill, addressing the Committee for Agriculture and Rural Development, cautioned that: ‘Stakeholders will have to be realistic and accept that, as everybody in this Committee knows, there is no quick fix to bTB and that it is likely to take a substantial time to achieve eradication here’ [48]. The optimism of 1951 appeared to have evaporated, and bTB was no longer described as ‘a disease which [straightforwardly] lends itself to practical control measures’ [12].

### **REVIEWING WHAT WENT WRONG: A VIEW FROM 1985**

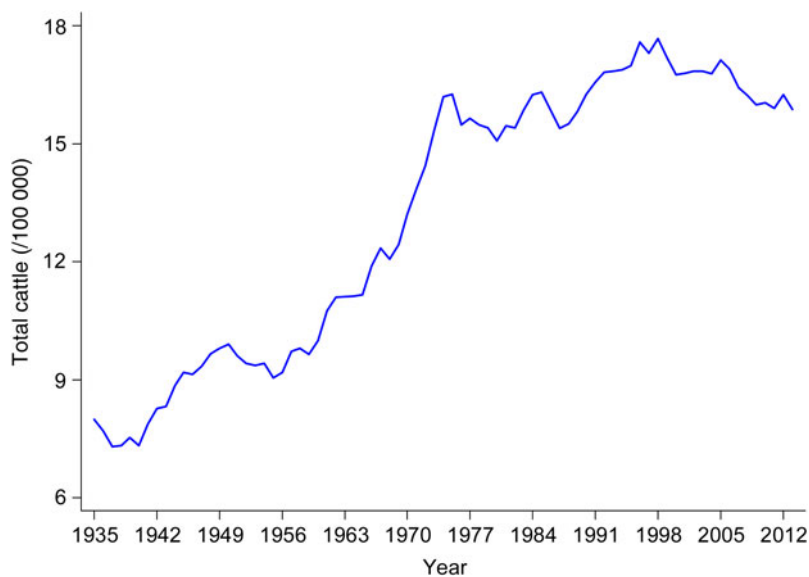
Mr G. P. Russell, the senior state vet then in charge of the Department of Agriculture’s bTB programme, reviewed the history of the bTB eradication programme in NI from 1949 until 1985 [30]. The unpublished Department of Agriculture document, presumably written for the benefit of the Department’s own Veterinary Officers, aimed to provide ‘background information to enable false or misleading statements to be corrected and veterinary advice reinforced whenever tuberculosis [came] up as a topic of conversation’ [30]. After summarising the nature of the disease and its transmission in cattle, reasons for eradication efforts, and the specific control measures employed in NI, Russell went on to discuss the problems in achieving the goal of eradication. His reasoning expanded and developed the debates of the 1970s policy meetings in Departmental headquarters. Significantly, he believed that there were peculiar features of bTB epidemiology in NI and the ROI compared to other countries which rendered it more difficult to manage [30]. He suggested three main reasons why he thought that the disease became re-established after the early 1970s, a time when the disease had been so close to being eradicated.

First, he noted the significant increase in the national herd, which had increased markedly between the 1950s and mid-1970s (Fig. 2). Sullivan [49] noted that the number of in-calf heifers and suckler cows in NI increased by nearly 50% between 1968 and 1973. Edwards [50] suggested that beef cow numbers had reached a high point by 1974 with the expectation from farmers that EEC entry would boost trade,





**Fig. 1.** Bovine TB herd incidence in NI, 1969–2013 (*Source of data:* Department of Agriculture and Rural Development, NI and Northern Ireland Audit Office, 1993 [5]). Herd incidence data interpolated for 1992–1994 due to missing values.



**Fig. 2.** Total cattle population of NI, 1935–2013 (*Source of data:* Department of Agriculture and Rural Development, NI.).

before subsequently decreasing for a period of years. In the dairy sector, average herd sizes increased from 19 cows to 39 cows between 1974 and 1986, with dairying regarded as an increasingly attractive commercial proposition [50]. These increased cow numbers resulted in more animal movement, a higher stocking density, and more potentially infected manure requiring disposal on land. Russell [30] stated that the uniquely high stocking density in NI was reckoned to be twice that of GB and four times that of Scotland. The volume of cattle movements was

regarded to be very high compared to other countries, but similar to the ROI. Russell quoted a visiting veterinary bTB expert as having suggested that ‘farmers in Ireland appear to regard [cattle markets] as local versions of the casino at Monte Carlo’ [30].

Second, and connected to the first point, in Russell’s assessment the importation of breeding females from the ROI was thought to be another major factor in the increased disease incidence between 1971 and 1975–1976 [30]. Demand for cattle was high north of the border, and in addition to

legal movements, illegal movements, including cross-border smuggling, were occurring. About 7000 beef steers (castrated male animals) were being imported from the ROI each month by mid-1976 [51]. Illegal importations of females between 1971 and 1975–1976 were thought to have been responsible for concurrent bTB and brucellosis increases [30]. Similarly, around 1980 the illegal importation of steers and heifers from the ROI were held to be responsible for the increase in bTB and the slow progress in the following years [30]. A decline in beef cow numbers in NI between 1974 and 1980 had caused a reduced supply of home-reared stock and increased demand for imports in 1980 to fulfil the demand for beef fattening [50].

Third, the ‘conacre’ system (Irish system of land tenure with land grazed between April and November) involved farmers renting land often at some distance from their main holding. This meant that infected herds were potentially distributed over wider areas, with multiple neighbouring herds being potentially exposed. Changes to animal husbandry, with increased stocking densities at both housing and at pasture, also provided increased chances of close contact between infected and non-infected cattle within herds as well as between herds [30].

Additionally, but less significantly, in Russell’s opinion farmers were also to be blamed for a failure to present all animals for bTB tests, both deliberately and accidentally. Despite all of the existing, and additional, control measures which Russell outlined, he believed that the ‘active co-operation of all herd owners’ was essential for them to function effectively [30]. He concluded that ‘in a very real sense, the key to successful disease eradication lies with the herd owner and he must therefore be given sound advice and encouragement whenever possible’ [30]. Deputy CVO Mr Bill Sullivan had taken a similar line writing 6 years earlier:

There are many things a stock owner can do to prevent and control the spread of tuberculosis. Farmers should not only endeavour to do these things but should encourage their neighbours to do so as well. Combined action between the farming industry and the Department of Agriculture will reduce tuberculosis to an even lower level than that at present [52].

Russell also thought there was a very social and human dimension – a lack of motivation, or a loss of will, indeed a ‘complacency on the part of all those involved in the eradication programme, because tuberculosis in cattle was thought to be a thing of the past’ [30]. Despite all of the successes of the preceding

decades, bTB remains very much a thing of the present, much to the disillusionment of many of those involved on the frontline of control.

## DISCUSSION

Many years ago, Kerr *et al.* [53] warned against overconfidence when turning the investigative gaze ‘to tuberculosis, the literature of which is so vast, complex and, in some instances, contradictory, that ... it is no easy task to acquire a sufficiently complete appreciation of the results and fallacies of the information available’. Despite the undoubted complexities of the problem, this historical account of bTB provides a deeper appreciation of how the challenges of today are firmly rooted in the past, and provide ‘points of entry’ or ‘credible problems’ [54] with which to begin to describe and explain the contemporary investigation of bTB eradication policy. The factors blamed for the persistence of bTB in the present echo what was already known several decades ago – not much has changed in the intervening years. Debates around the role of farmers and their lack of attention to farm biosecurity; the performance of bTB testing by vets; attempts to improve state governance; and confusion over how to reduce the spread of bTB are all present in the minutes and memoranda of the mid-1970s.

History illustrates how bTB eradication has always been set within a political economic context governed by the state. The state came to intervene in an animal/human disease problem initially through voluntary, but later compulsory regulation, with a state emphasis on rule-keeping for both farmers and vets. After initial success with this approach in the first 10–15 years, the state then experienced a failure in the 1970s to govern the disease and its actors, with most blame being attached to the humans involved (farmers and vets). The attitudes and practices of *people*, particularly farmers, are at the centre of animal disease control. The importance of farming and land management practices involving cattle trading and land tenure across multiple farm holdings come to the fore; these everyday practices of farming affected the ecologies of disease transmission within the landscape, and continue to do so in the present.

If farmers were thought to be the key to bTB eradication in NI in the 1950s, what incentives encouraged their cooperation in the early years of the programme? In this regard, the historical importance of economic drivers for the eradication of bTB cannot be ignored.

Whether as compensation for reactors; bonus payments for disease-free herds; or improved market conditions through export markets, economic factors have always been at the forefront of farmers' minds. But this is not just a feature of disease eradication in NI, for Magnusson [55] noted a similar driver in Sweden more than 70 years ago:

The retrogression, stagnation or progression of the anti-tuberculosis campaign has always in the long run depended on economical [*sic*] factors. If the animal-owner receives compensation for his losses he is always prepared to cooperate to the fullest extent. That Sweden seems in recent years to be able to solve the tuberculosis problem so successfully ... is undoubtedly due to ample state grants ... in furthering tuberculosis work.

Russell [30] suggested that the main justifications for initiating a bTB eradication programme in NI were the zoonotic effects of cattle disease on human health, and the negative effects bTB had on the efficiency of cattle production. These were undoubtedly important factors, but, as has been clearly demonstrated in this historical narrative, the increased economic value of disease-free animals and the absolute necessity for maintenance of the export trade to GB could certainly be added to the list, and were arguably much more significant.

Moving forward to the present day, the absolute requirement to export NI-produced milk and beef still exerts strong market pressure on bTB eradication efforts. Addressing the NI Assembly's Agriculture Committee at Parliament Buildings, Stormont, on 3 July 2012, the Minister of Agriculture and Rural Development Mrs O'Neill emphasized the need for EU approval of the bTB eradication programme, and stated that this was 'vital to safeguard [the] annual £1 billion-plus export-dependent trade in livestock and livestock products', and that protecting NI's export status was 'a fundamental priority' for her Department [56]. What links the past with the present is the absolute necessity for the state to keep export channels open, virtually whatever the cost. As long as that cost exceeds the trade benefits reaped, there is an economic logic in continuing as before, even with a frustratingly persistent bTB problem which defies resolution. Perhaps the threats of impending trade barriers from GB in the period around 1957–1958 focussed minds more acutely in the past than EU legislation and open markets does in the present.

For bTB, the state's belief that the job could be completed was unwavering throughout the 1950s

and 1960s, but the archives reveal that doubts came to the fore in the subsequent decades. It is not unusual to have doubts in longstanding disease eradication programmes. Celebrating India's certification as being polio-free, a director of the Global Polio Eradication Initiative stated that in addition to ensuring every child was vaccinated, the most important factor was 'believing, unwaveringly, that the job could be completed' [57]. That belief is currently lacking for bTB, and an open and honest appraisal needs to begin about what the programme plans (or rather, hopes) to achieve over the next 5, 10 and 20 years. Setting targets may provide definite goals to aim for, and a sense of purpose. By way of example, England's target is to eradicate bTB by 2038 [58], and just as there were definite targets to aim for in the early years in NI, there surely needs to be a renewed focal point for the future.

Despite the very successful first decade of the statutory eradication programme, after which bTB herd incidence had been reduced to 0.50% by 1970, a reduced frequency of testing concurrent with a rapidly increasing cattle population in the early 1970s meant that the disease took hold once again. Failings in the conduct of the tuberculin test by private vets were often criticised by state officials in the 1970s, and concerted attempts were made to change behaviours, but with close supervision of vets' testing by state veterinary inspectors in the present, this may be more to do with the failings of the technology to detect infection rather than failings in the actual performance of the tuberculin test by vets. With the benefit of hindsight it certainly appears to have been premature to reduce herd testing frequency in the early 1970s. If testing had continued as annual rather than becoming biennial and then triennial, it could be postulated that we may not have the problem that exists today; taking the foot off the bTB testing pedal appears to have been a false economy with long-term consequences.

Although much progress has been made in reducing the bTB incidence in NI when considering the long view over more than half a century, the remaining rump of disease continues as an ongoing burden on the tax payer, and bTB has proven particularly difficult to further reduce to the negligible levels of the early 1970s. With the significantly altered demographics and economy of cattle production since the early 1970s, the state veterinary services have been struggling to *contain* rather than eradicate the slippery disease that is bTB. Importantly though, the economic benefits of even maintaining the *status quo* of bTB

control must be highlighted. Given the nature of this complex and tortuous problem, I suggest that control is an achievement not to be underestimated and undervalued, when the endgame of eradication of bTB is still years, even decades away. If the bTB programme is to adopt innovation and radical change, whatever that may be, there surely needs to be a ‘full and serious open-minded process of appraisal of not just risks, but of benefits-claims and promises, and of alternatives’ [59]. The problem is that not everyone today sees the benefit of engaging or making progress. While in no way belittling the suffering of those chronically and severely affected by bTB outbreaks in their herds, I suggest that many of the farming stakeholders involved in bTB control do not see the current programme’s success in maintaining global markets for NI produce, at considerable financial cost to the state and its taxpayers; the stakes were much clearer in the late 1950s.

Control, while extremely valuable in keeping open export markets and reducing the health threat to animals and humans, can be improved upon, and it should be possible to edge ever closer to eradication. Without vision and hope for the future, even the fragile grip of control can quickly be lost. This needs to be ‘hope with its sleeves rolled up’ [60]. Many years of toiling has brought fatigue, and in many quarters, apathy. As a result, renewed effort and aspiration for the long-term from all involved in the bTB governance network is required. This requires effective and visionary leadership from the state, and farmers and vets must be ready to step up and play their part. Too many cattle have had to be tested and slaughtered, and too much money has been spent over many years to give up now; conceding defeat is surely not an option. Nonetheless, changes must be made to the current programme and its governance in order to move close once again to the goal of eradication. Only then may we (perhaps) declare again that ‘it is now apparent that tuberculosis in cattle is a disease which lends itself to practical control measures’ [12]. What is clear is that ‘people factors’ – economic, social and political – have always had a very important bearing on the success of the bTB programme in NI ever since it began in earnest more than six decades ago.

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## DECLARATION OF INTEREST

None.

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