

## Some of World's Largest Legionella and Q Fever Outbreaks in a Small Country: Co-Incidence?

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### Abstract

The Netherlands faced one of the largest Legionnaires' disease outbreaks and the largest Q fever outbreak in the world in the last two decades. Historical perspectives show that an organization model in which Public Health is placed under the supervision of the Agriculture Ministry results in economics and politics prevailing over fighting infectious disease. The consequences were dramatic. It is concluded that awareness, commitment and primary mandatory power of the Public Health department are essential to fighting infectious disease effectively.

### Introduction

In 1999, an outbreak of Legionnaires' disease affected many visitors to a flower show in the Netherlands. Of 77.061 visitors 188 became ill (133 confirmed and 55 probable cases), for an attack rate of 0,23% for visitors and 0,61 for exhibitors. Two whirlpool spas in halls 3 and 4 of the exhibition and a sprinkler in hall 8 were culture positive for *Legionella pneumophila*.

One of three genotypes found in both whirlpool spas was identical to the isolates from 28 of 29 culture positive patients. Persons who paused at whirlpool spa in hall 3 were at increased risk for becoming ill. Whirlpool spas were identified as an important health hazard as disinfection fails [1].

Of the 188 patients 163(87%) were hospitalized and 34 (21%) required mechanical ventilation. Seventeen persons with confirmed and 4 with probable Legionnaires'(LD) died, for a case fatality rate of 11%. The case fatality rate was highest (17%) in patients over 70 years.

This outbreak is only exceeded by the original 1976 outbreak in Philadelphia (221 cases) – [2]. The fact that the outbreak was not detected until 14 days after the first case of pneumonia was diagnosed when 71 patients had already been hospitalized is remarkable.

The Netherlands faced an exceptionally large outbreak of Q fever from 2007 to 2010, probably starting already in 2005. More than four thousand (4026) cases were notified which makes it the largest Q fever outbreak ever reported [3]. The disease seemed to take us by surprise. Thousands of people fell ill, dozens of people died (74) and patients continue to suffer from chronic Q fever until today. Eventually, tens of thousands of pregnant dairy goats were killed to prevent the causative agent of Q-fever, *Coxiella burnetii* to spread. The outbreak and its consequences still resonate in court cases, regional politics and reports by the National Ombudsman.

How could this happen? The most common explanation given by the responsible politicians was that the collaboration between veterinarians, GP's and Infectious medicine specialists ("One Health Concept") has not been good. However, this cooperation is institutionalized in the RIVM (Dutch National Institute for Public Health) satisfactory for decades. So, is this the right analysis? Historical perspectives provide a very different shocking analysis [4].

Since the 20<sup>th</sup> century the Netherlands handled zoonotic diseases in production animals not as a primary public health problem but as an agricultural problem. The Ministry of Public Health has a secondary responsibility in these and is residing under the responsibility of the Ministry of Agriculture.

The underlying base for this separation and division in responsibilities has been established during the bovine tuberculosis epidemic in the first half of the last century. When new bacteriological knowledge led to preventing measures spreading the diseases by infected raw milk and meat various countries issued import halts. This was the most important reason for livestock farming and the Agriculture Ministry to act together against it. Until the end of World War Two the fight of tuberculosis was paid by agricultural subsidies. It was only with the post War2 Marshall aid that tuberculosis became a mandatory reporting disease and part of the Public Health domain.

In the 1950's and sixties these power relations between the different Ministries resulted in a big conflict in fighting foodborne Salmonella infections. Health authorities tried to tackle the upcoming "bio-industry" and proposed sterilization procedures of fish and bone meal components of cattle fodder. However, agriculture organizations protested heavily. At the end the problem still exists nowadays and health authorities can only give information campaigns to prevent foodborne Salmonella outbreaks.

Bovine spongiform encephalopathy (BSE) or “mad cow” disease was fought very successful in the 1980’s by the Dutch Agriculture Ministry and agriculture organizations. Commercial interests fearing an export stop were the driving main reasons and Public Health was bypassed again. The BSE crisis was a turning point for the U.K. and European Union which directed primary responsibility for food safety and zoonotic diseases to the Public Health departments. However, the Netherlands did the opposite in 2003 and confirmed this responsibility is at the Agriculture Ministry, prevailing economic motives.

Behind this background it is therefore no surprise that a small country saw a massive Legionella outbreak in favour of the economic importance of an international Flora Show and the largest Q-fever outbreak in the world for the same trivial reasons. When politics and economics prevail over Public Health concerns even a sophisticated health care system as in the Netherlands will not help you. For this awareness and a committed Public Health department with mandatory power is essential This is showed by the City of New York, a nation leader in taking care for the majority of Legionella outbreaks in the U.S [5].

## Conclusion

It cannot be told enough that efficient fighting infectious diseases needs a strong Public Health department with primary mandatory power. Historical mistakes in the Netherlands, prevailing economics and politics over Public Health, had dramatic consequences in a large Legionnaires’ disease outbreak and in the largest Q fever outbreak in the world.

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