Socioeconomic Burden of Tularemia Infection in Sweden: A Cost Analysis of Healthcare Expenditure and Productivity Losses

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Introduction

Tularemia is an endemic and re-emerging zoonotic disease in Sweden, frequently affecting working-age individuals and often resulting in prolonged recovery times. Common manifestations include (ulcero)-glandular, pneumonic, and typhoidal (septicemic or occult) disease [1].

The disease-related economic impact of type B tularemia has not previously been investigated. In this study we assess the economic burden associated with endemic tularemia in Sweden.

Methods

Data on primary care visits, hospital admissions, and sick leaves were collected from participants with serology-confirmed tularemia through questionnaires and electronic medical records in Northern Sweden from 2011 to 2021.

The dataset was enhanced with national cost-of-care data for tularemia in primary and specialist care from NordDRG (Diagnosis Related Group; 2021-2023), and sickness benefit data from the Social Insurance Agency (2011-2023).

Total direct and indirect costs were estimated by integrating these data sources and adjusted for inflation to 2025 levels. Average salary and labor productivity (Gross Domestic Product [GDP] per person employed) was assumed.

Results

Among participants (n=294), the mean age was 52 years; 68.1% were employed or job-seeking, with 71.3% of these reporting sick leave during illness.

Healthcare costs were primarily driven by general practitioner visits (mean 1.74 visits; 5,125 SEK per participant [p.p.]) and hospital admissions (15.6% of participants; mean 4.7 days; 11,268 SEK p.p.) with relatively low clinical complexity scoring (mean DRG weight 0.8). Antibiotic treatment and diagnostics were less costly (**figure 1**).

Indirect costs included sick pay (≤14 days; 70.0% of cases; 4,106 SEK p.p.), sickness benefit (>14 days; 30.0% of cases; 5,835 SEK p.p.), and lost GDP-based productivity; combined making up 75.7% of total costs (78,503 SEK p.p.).

A mean of 394 (range 87-1,048) tularemia cases per year were reported to the Swedish Public Health Agency between 2011-2023 [2]; hence, the estimated annual societal cost of human tularemia infection was 30.9 million SEK (range 6.8-82.3 million SEK).

Discussion

Tularemia imposes a substantial socioeconomic burden on society primarily through morbidity and prolonged recovery. There is annual variation in number of reported cases, with most cases reported during the summer months of July to September. Outbreaks could therefore have detrimental effects on local economy and public services.

As a potential bioterrorism weapon, the economic impact associated with an intentional aerosolized exposure to *Francisella tularensis* (type A) has previously been estimated at 1,257,400 SEK (adjusted for 2025 inflation) for every case of pulmonary/typhoid tularemia, largely attributable to deaths (7.5% of cases, 90.5% of costs) and hospital admissions (95% of cases, 8.0% of costs) [3]. Similarly, pneumonic forms of Type B tularemia have prolonged hospital admissions (average 13 days) and can occur as natural outbreaks in Sweden [4}.

Further evaluation of the cost-effectiveness of primary and secondary preventive measures in endemic settings is required.

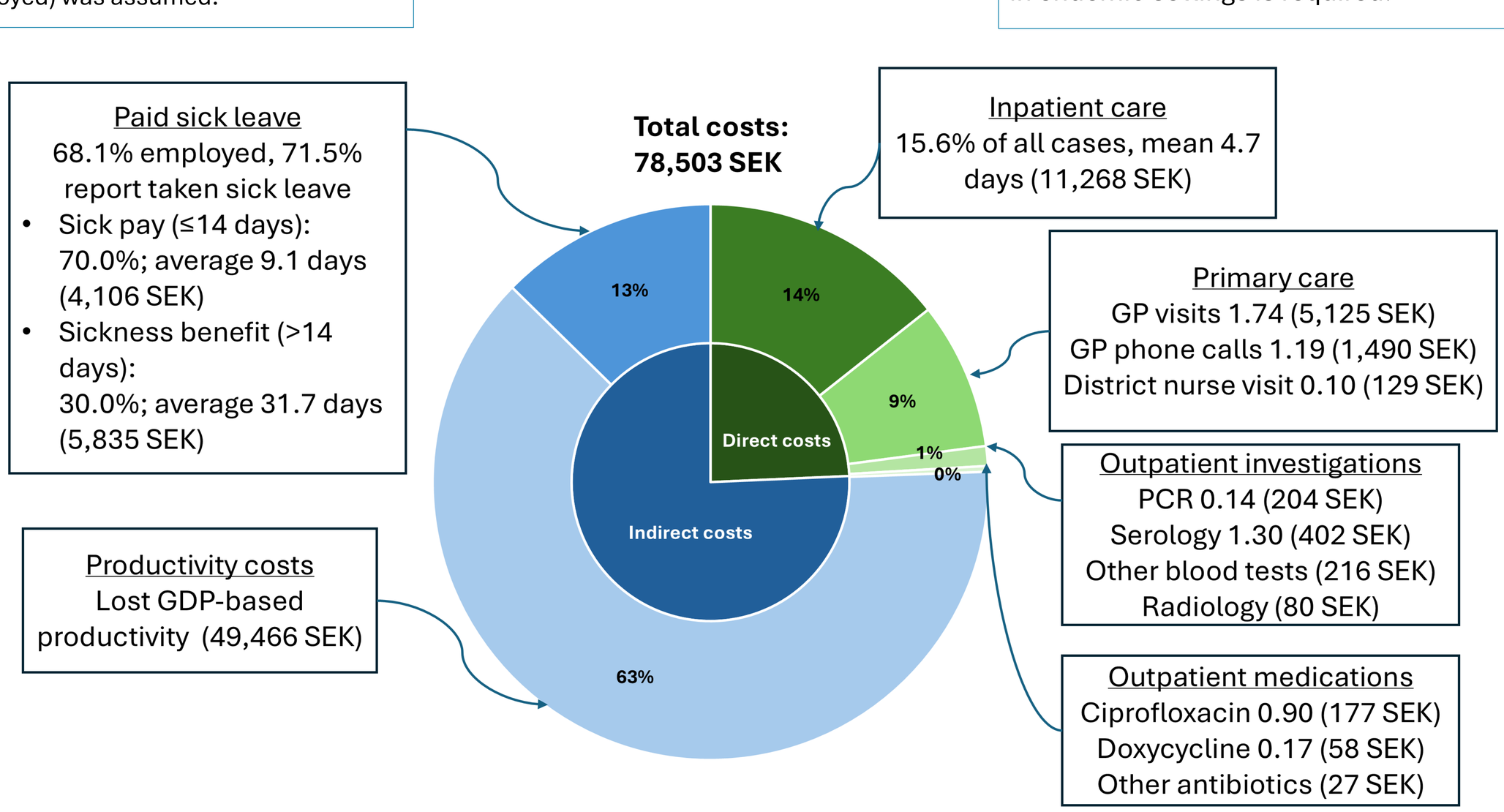

Figure 1. Estimate of direct and indirect costs of tularemia infection per person, based on results from a cohort of 294 respondents, in 2025 inflation-adjusted SEK. GDP: Gross Domestic Product. GP: General Practitioner; SEK: Swedish Crown.

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