

The Utilization of Hospital Inpatient Care due to Tuberculosis, Republic of Ireland, 2015-2018

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1. National Tuberculosis (TB) Epidemiology 2019

- Declining incidence; 315 cases, 5.6 cases per 100,000 in 2019 vs 6.6 cases per 100,000 2018
- 43.8% non-Irish born
- 5 Multi-drug resistant (MDR)-TB cases
- 13 cases of HIV-TB coinfection (of 131 cases screened for HIV)

2. National Healthcare System

- Mixed public-private system
- 74% of healthcare expenditure in 2018 was funded by government, 14% by private health insurance and 12% by out of pocket payments
- Cost of all TB medications covered by government
- TB clinics in centres with specialists experienced in managing TB

3. Research Question

- In a previous single centre cohort study in Ireland we found that 91% (32/35) of TB patients had a hospital admission
- Hospital admissions contributed significantly to the cost of care for TB patients
- Our aim was to determine if there was a high utilization of hospital inpatient care nationally and if we could describe the patients who require hospital care

4. Methods

- We searched the national hospital inpatient coding data for all admissions coded as having one of a pre-defined set of ICD-10 codes for TB as the principal diagnosis.
- We extracted for every admission the admission identification number, demographic data, admitting hospital, admission source, discharge destination, admission type (emergency or elective), principal speciality, secondary diagnoses and Charlson Comorbidity Index. We matched admissions based on age, sex, county of residence and postal code.
- We followed national guidance to estimate the cost of episodes of care.
- We used national surveillance data to provide a denominator for the number of TB cases nationally in this period.

5. Utilization of Hospital Inpatient care

There were 1185 admissions with TB as the principal diagnosis, 76.9% (911/1185) of which were in patients with respiratory TB. Emergency admissions made up 67.6% (801/1185) of all admissions, of which 76% (609/801) were in patients with respiratory TB. From 2015 to 2018 there were 1257 cases notified in the Republic of Ireland. There were 818 patients identified after matching of admissions. We estimate that the proportion of cases notified who had an admission is 65.1% (818/1257). Of these, 73.1% (615/841) of cases of respiratory TB notified had an admission compared to 48.8% (203/416) of cases of non-respiratory TB. We estimate that 50.8% (639/1257) of cases notified had an emergency admission. Of these, 57.3% (482/841) of cases of respiratory TB notified had an emergency admission compared to 37.7% (157/416) of non-respiratory TB.

6. Characteristics of Patients with TB Admitted to Hospital, Republic of Ireland, 2015-2018	All	Respiratory TB	Non-respiratory TB
Total (proportion of all patients)	818	615 (75.2%)	20 (24.8%)
Median age (interquartile range)	43 (23-60)	43 (29-60)	43 (29-61)
Male sex (proportion of total)	499 (61%)	381 (62%)	118 (58.1%)
Drug resistant TB (proportion of total)	14/818 (1.7%)	13 (2.1%)	1 (<1%)
HIV (proportion of total)	28 (3.4%)	21 (3.4%)	7 (3.4%)
Any Social determinant or risk factor for TB (proportion of total)	138 (16.9%)	115 (18.7%)	23 (11.3%)
Diabetes (proportion of total)	60 (7.3%)	44 (7.2%)	16 (7.9%)
Alcohol misuse (proportion of total)	53 (6.5%)	49 (8%)	4 (2%)
Illicit drug use (proportion of total)	18 (2.2%)	17 (2.3%)	1 (<1%)
Incarceration (proportion of total)	3 (<1%)	2 (<1%)	1 (<1%)
Contact with and exposure to TB (proportion of total)	10 (1.2%)	10 (1.6%)	0
Homelessness (proportion of total)	15 (2.2%)	14 (2.3%)	1 (<1%)
Died during an admission (proportion of total)	18 (1.7%)	13 (2.1%)	5 (2.4%)

7. Aetiology of Hospitalizations

741/801 (80%) of emergency admissions had a Charlson Comorbidity Index of 0. 131/801 (16.4%) of emergency admissions had a side effect potentially attributable to anti-mycobacterial usage coded. 110/801 (13.7%) had a requirement for isolation of any type coded. 146/801 (18.2%) of emergency admissions had sepsis, systemic inflammatory response syndrome, volume depletion, end-organ dysfunction or a requirement for intensive care/coronary care coded. 21/801 (2.5%) had non-adherence to a medication coded. 18/801 (2.2%) had resistance to an antimycobacterial coded. 503/801 (61.5%) of episodes of care had none of these coded.

The mean cost of emergency admissions per year was €2,250,926 - 2,557,397 per year.

8. Discussion: We found that there were a large number of hospital admissions, particularly emergency hospital admissions and that when expressed as a proportion of TB cases notified this proportion is high. This comes at considerable cost to the health service. These admissions did not appear to be due to sepsis, critical illness or TB medication side effects. The proportion of patients with drug resistance or HIV is low, similar to the national surveillance data. We found that patients with diabetes/alcohol misuse/homelessness/drug use/incarceration/TB case contact or those with comorbidity as measured by the Charlson Comorbidity index had longer more costly episodes of care. The burden of TB on hospital inpatient care in the Ireland is significant. The national TB policy should change in recognition of this.