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Epidemiology of Healthcare Facility-Associated Nontuberculous Mycobacteria at a 10-Hospital Network

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Background

- Nontuberculous mycobacteria (NTM) commonly cause healthcare facility-associated (HCFA) infections and outbreaks, yet data on the epidemiology of HCFA NTM are sparse.
- **OBJECTIVE: Analyze the epidemiology of NTM at a network of U.S. academic hospitals**

Methods

- 10 U.S. academic hospitals with large thoracic transplantation volumes (Table)
- Retrospectively analyzed data on positive cultures for NTM obtained from 2012-2020
- An NTM episode was a patient's first positive culture for a particular NTM species and specimen source category (pulmonary vs. extrapulmonary)
- Episodes linked to isolates obtained on day 3 or later of hospitalization were considered hospital-onset (HO) NTM
- 7 hospitals contributed at least 12 months of baseline data prior to 2014
  - For this closed cohort, trends of NTM incidence rates from 2014-2020 were estimated with log regression

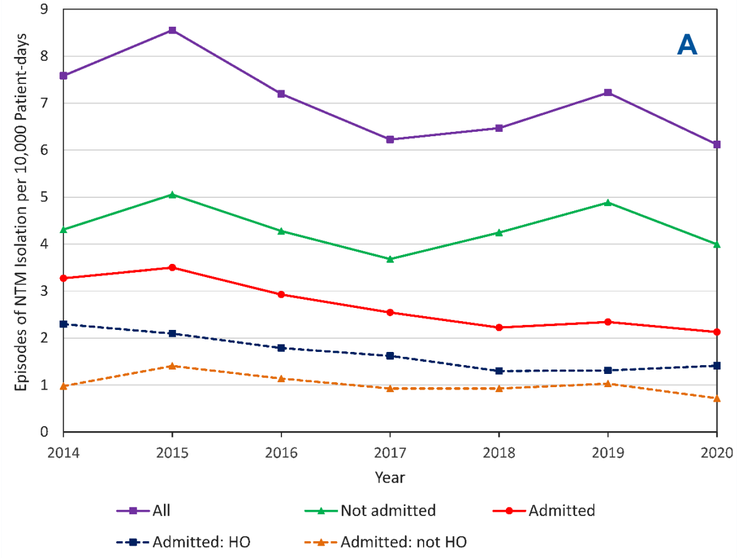
Results

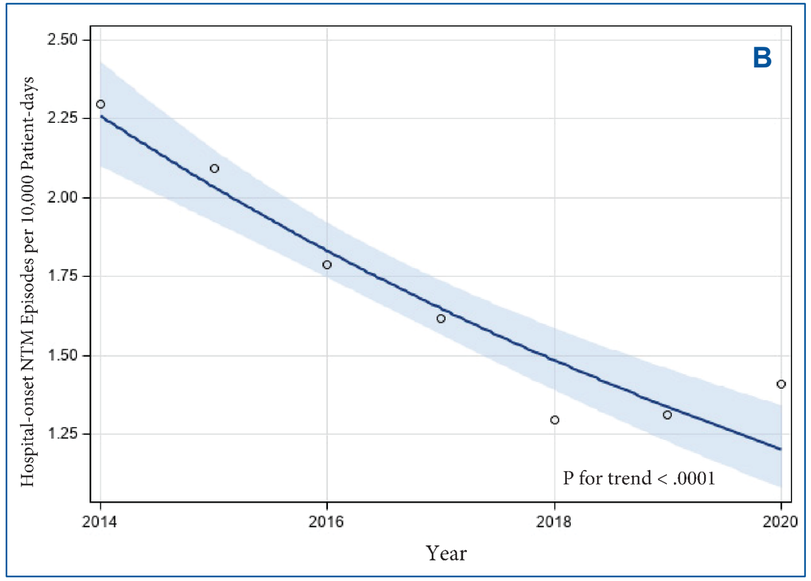
- 24,376 total NTM isolates identified during >19 million patient-days of surveillance at 10 hospitals
- 12,847 (53%) isolates represented unique NTM episodes
- 3,044 (24%) episodes were HO-NTM (Table)
  - Median hospital HO-NTM rate: 1.1 episodes per 10,000 patient-days (IQR, 0.6-2.2 episodes)
  - *M. avium* complex: 1,466 (48%); *M. abscessus* complex: 397 (13%); *M. chelonae-M. immunogenum*: 348 (11%); *M. gordonae*: 222 (7%); *M. fortuitum*: 141 (5%)
  - 595 (20%) HO episodes were extrapulmonary
- From 2014-2020 within the 7-hospital closed cohort, HO-NTM incidence decreased from 2.3 to 1.4 episodes per 10,000 patient-days (IRR 0.6; 95% CI 0.5-0.7; P<.0001) (Figure Panel A)
- Trend analysis within the same cohort estimated an annual decrease in HO-NTM of 10% (95% CI, 8-12%; P<.0001) (Figure Panel B)

Table. Culture-based NTM surveillance from 2012-2020 at a 10-hospital network

Hospital No.	Hospital Location (State)	No. of Months of Surveillance (Dates)	Patient-days	HO-NTM Episodes	HO-NTM Episodes per 10,000 Patient-days
Hospital Cohort Included in Longitudinal Rate Analyses					
1	Texas	102 (Jul 2012 – Dec 2020)	1,061,328	582	5.5
2	North Carolina	108 (Jan 2012 – Dec 2020)	2,661,791	896	3.4
3	Pennsylvania	108 (Jan 2012 – Dec 2020)	2,181,919	472	2.2
4	Missouri	108 (Jan 2012 – Dec 2020)	2,908,853	335	1.2
5	Pennsylvania	108 (Jan 2012 – Dec 2020)	1,876,399	180	1.0
6	Washington	108 (Jan 2012 – Dec 2020)	1,146,185	63	0.5
7	Ohio	96 (Jan 2013 – Dec 2020)	2,889,956	103	0.4
Hospitals that Contributed Data Beginning after January 2013					
8	Michigan	90 (Jul 2013 – Dec 2020)	2,309,444	266	1.2
9	North Carolina	54 (Jul 2016 – Dec 2020)	1,155,212	84	0.7
10	Tennessee	36 (Jan 2018 – Dec 2020)	1,057,050	63	0.6
10-Hospital Totals		**918 (Jan 2012 – Dec 2020)**	**19,248,137**	**3,044**	**1.6**

Figure. Incidence rates of NTM episodes from 2014-2020 at a 7-hospital cohort (*Panel A*) and log regression model of HO-NTM with predicted and observed rates (*Panel B*)





Conclusions

- Network HO-NTM incidence rates decreased from 2014-2020, but rates at individual hospitals varied substantially
- These comprehensive data on NTM isolation and incidence rates can serve as external benchmarks for NTM surveillance
- Given substantial hospital variability, NTM surveillance at the individual hospital level is paramount

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