Pulmonary Non-tuberculous surveillance summary 2021-2022, reported July 2023

The Oregon Emerging Infection Program (EIP) conducts laboratory and population – based surveillance for Pulmonary non-Tuberculous mycobacterial infection (P-NTM). NTM surveillance program was piloted 2019-2020 and has continued with ongoing surveillance in four EIP sites including Oregon. In 2021, Oregon EIP undertook active surveillance for pulmonary NTM infection in the Tri-County area of metropolitan Portland that include the counties of Multnomah, Washington, and Clackamas (2021 population, 1,825,557). P-NTM is not required to be reported by clinicians or laboratories and sample submission to the Oregon State Public Health Laboratory is not required.

Surveillance Objectives are:

- Describe the epidemiology of P-NTM.
- Describe microbiologic characteristics of public health relevance.
- Evaluate antimicrobial susceptibility of organisms causing P-NTM infections.
- Characterize the molecular epidemiology of P-NTM.

Diagnosis of pulmonary NTM based on isolation of NTM species from a single sample of bronchial wash, bronchoalveolar lavage (BAL) or lung tissue specimen; or from two separate induced or expectorated sputum samples and finally from biopsy specimen with histopathologic feature and identification of NTM via culture or culture independent test method. After the initial sputum sample collection, a confirmatory sample may be collected within the following 12 months. Since surveillance started in January 2021, 155 patients with Pulmonary NTM infections have been reported in the Tri-county area. Fig 1 shows the distribution of initial sample collection time. Eighty-nine cases were reported in year 2021 and 66 cases in 2022. Table one show: Number of females (n=102) is about the double of males(n=53). The age group 60 years and above had over 80% of cases for males and about 90% of cases for females. No cases detected under 20 years old for males and under 30 years for females.

Fig 1. P-NTM cases of Tri-county area by date of index specimen collection, January 2021-December 2022

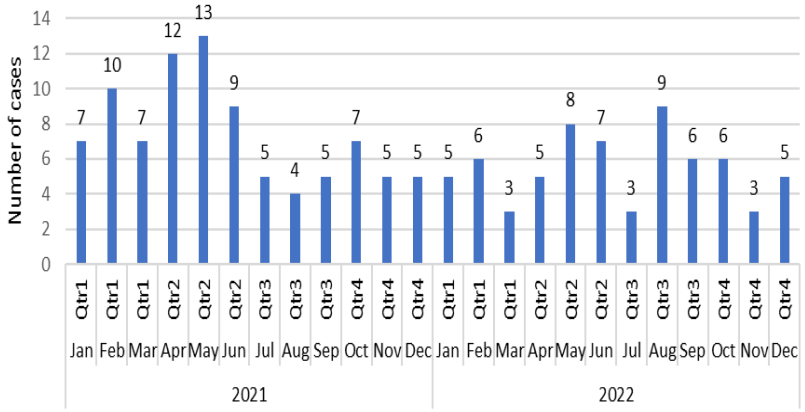

Table1. P-NTM cases, January 2021- December 2022 by age group and sex, Tri-county area, Oregon

Age group, years	Male		Female	
	n	%	n	%
20-29	1	2%	0	0%
30-39	1	2%	2	2%
40-49	3	6%	3	3%
50-59	4	8%	6	6%
60-69	10	19%	37	36%
70-79	21	40%	38	37%
=>80	13	25%	16	16%
Total	53		102	

As per table 2, Most of P-NTM cases have white race 83%, Asian 10% and black or African American 5%. Most of cases had non-Hispanic or Latino ethnicity (94%).

Table 3 shows the NTM species as provided in lab reports from collaborative laboratories. Most of isolates cultured from the index sample revealed that *Mycobacterium avium complex* group is the most predominant in the Tri-county area (84%), while the non-*mycobacterium avium complex* cultured identified from 17% of samples.

The most predominant species from MAC is M. *intracellulare subsp. Intracellulare* 44%, followed by *M. avium* 36%. While for Non-MAC the most predominant species was *M. abscessus complex* (10%).

Only one case had both the *M. intracellulare subsp. Intracellulare* and *M. fortuitum* isolated from the same index specimen.

Clinical diagnosis of P-NTM is sometimes difficult, however, 68% of P-NTM cases had a

Table 2. Distribution of P-NTM cases by their race and ethicity, Tri-county area, January 2021-December 2022

Race	n	%
American Indian or Alaska Native	<5	NA
Asian	15	10%
Black or African American	7	5%
Native Hawaiian or Other Pacific Islander	<5	NA
White	128	83%
Unknown	<5	NA
Ethnicity		
Not Hispanic or Latino	146	94%
Hispanic	<5	NA
Unknown	7	5%

Table 3. NTM isolates by species isolated from P-NTM cases, tri-county area. January 2021-December 2022

Pathogen*	n	%
M. avium complex (MAC)	130	84%
M. avium	56	36%
M. intracellulare subsp. Chimaera	2	1%
M. intracellulare subsp. Intracellulare	68	44%
Other MAC	0	0%
MAC, not otherwise specified	2	1%
Non-*M. avium* complex (Non-MAC)	27	17%
M. abscessus complex	16	10%
M. chelonae complex	2	1%
M. fortuitum group	6	4%
M. Kanasasii	2	1%
Other non-MAC	2	1%
Non-MAC, not otherwise specified	0	0%
Physician diagnosed pulmonary disease	155	
Yes	105	68%
No	42	27%
Unknown	8	5%

* Total pathogens detected were from 155 case

Table 4. shows the specimens collection sites from P-NTM cases. The most frequent specimen collected was sputum either induced or expectorated (62%) and bronchoalveolar lavage (35%). The specimens were collected mostly in outpatient setting (74%) and one quarter of specimens were collected during hospitalization (25%).

Table 4. Pulmonary Index specimen collection type and site for P-NTM cases, Tri-county area, Oregon, January 2021-December 2022

Specimen type	n	%
Bronchoalveolar lavage	54	35%
Lung tissue	5	3%
Sputum (expectorated or induced)	96	62%
Tracheal aspirate	0	0%
Other lower respiratory site	0	0%
Specimen collection site	**n**	**%**
Inpatient	39	25%
Outpatient	115	74%
Unknown	1	1%

Figure 2 revealed the top 10 exposures that the patients with P-NTM had within the last 12 months prior to index sample collection.

- One quarter had used nebulizer in the prior year to DISC.
- 14% practice gardening or landscaping.
- 11% had used injections or infusions.
- 11% had surgical procedure.
- 9% had dental procedure.

Fig 2. Top 10 exposures associated with P-NTM in the year prior to index specimen collection, Tri-county area January 2021-December 2022

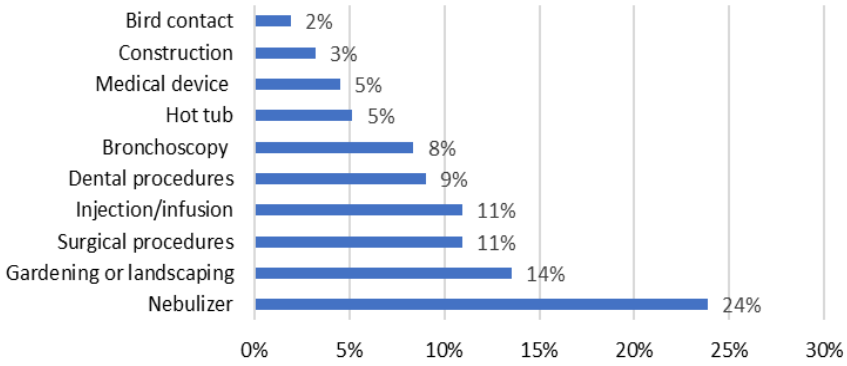

Table 5. shows the top 10 comorbid medical conditions associated with P-NTM

- 83% had Chronic pulmonary disease as COPD (25%), Emphysema (17%) and bronchiectasis (61%).
- 25% had non metastatic malignancy.
- 14% had Diabetes mellitus, 5% with complications.
- 14% had connective tissue disease as Rheumatoid arthritis (4%).

Table 5. Top 10 comorbid conditions with P-NTM, Tri-county, Oregon, January 2021-December 2022

Chronic condition	n	%
Chronic pulmonary disease	128	83%
Malignancy, solid organ (non-metastatic)	39	25%
Connective tissue disease	22	14%
Diabetes mellitus	21	14%
Neuropathy	15	10%
Chronic kidney disease	14	9%
Diverticular disease	14	9%
CVA/Stroke/TIA	13	8%
Congestive heart failure	12	8%
Peripheral vascular disease (PVA)	12	8%