



EPIDEMIOLOGY: PREVALENCE DATA

- Adjemian, Olivier, Seitz, Holland, Prevots, NIH. 2012
- Purpose: Assess prevalence of PNTM
- Medicare claims 1997-2007 – 5%
- Age 65+
- Annual prevalence rose from 20/100,000 to 47/ 100,000
- 8.2% per year increase
- Women 1.4 more likely than men to be PNTM case than men



- **Significant geographic**

EPIDEMIOLOGY: ENVIRONMENTAL MYCOBACTERIAL LATENCY

Schraufnagel, 2017

- Reviewed study above of Ford noting that most patients ran into clinical trouble based on co-morbidities rather than NTM
- Studied country of origin of patients:
 - *M. fortuitum* increased in Asian-born
 - *M. lentiflavum* increased in African-born
- Pathology specimens indicate that NTM reside in sub-epithelia of small airways of bronchiectatic airways and biofilms

THUS: Is it possible that individuals harbor organisms far longer than we think AND that they cause bronchiectasis?





OPPP'S

- NTM are **saprophytic organisms**
 - Grow within ***engineered*** water systems
 - Less well understood
 - Not human-to-human spread

BIOFILM

- **The slimy film that coats all (non-copper) pipes**
- **All water mains, pipes leading to the home and in the home have them**

- **All but impossible to eliminate**

BTW: Plastic rather than copper pipes proposed as a reason for uptick in NTM from showers, etc.

BIOFILM AND NTM

- *M. abscessus* less adherent than
- *M. avium* and *M. intracellulare* on surfaces

RELATIVE RISK OF CLUSTERS OF PULMONARY NTM AMONG MEDICARE BENEFICIARIES

- High risk

- Highlands, FL 1.9
- Santa Barbara, CA 2.0
- New York, NY 2.7
- Kalawao, HI 3.7
- Plaquemines, LA 6.5

- Low risk

- Washington, RI 0.5
- Iosco, MI 0.4
- Roane, WV 0.4

PREVALENCE: PROXIMITY TO WATER CF CHILDREN

Bouso et al. 2016

- Retrospective chart review 65 children in Florida
- 21(32.3%) had 2+ positive sputum cultures NTM
- 3 year follow-up

- CF patients who lived *within 500 meters* of water were **9.4 times** more likely to have NTM

- Perhaps a new in-between level of water exposure:
- *Not* the ambient climate and *not* the pipes in your house







EVALUATION: THE ENVIRONMENT

- Water and soil organism
- Agriculture workers
- Hot tubs
- (Steam rooms, room humidifiers, others??)

- Problem: It is in *everyone's* home
 - Husband and wife
 - Apartment and pool health club
 - Different *M. avium* subtypes and home sources!!

- Geography
 - Regional – Hawaii, Louisiana vs. desert states
 - Proximity to water

EVALUATION: THE PATIENT

- Anatomic predisposition
 - Bronchiectasis
 - Location and extent
 - COPD
 - Interstitial lung disease
 - Other lung damage
 - Sarcoidosis
- Immune deficiency
 - Immunoglobulin deficiency
 - Alpha-1-antitrypsin def
 - Cystic fibrosis (younger patients) – subclinical types – sweat test/blood
 - Ciliary dysfunction
 - *Most other genetic abnormalities not clinically relevant*

EVALUATION: THE PATIENT

- Immune compromise: External factors
- Medications:
 - Immune modifying
 - Need to be specific
 - Prednisone/ systemic steroids-
 - Relative
 - How much?
 - For how long?
 - Biologics/ TNF alpha inhibitors
 - Inhaled/ topical steroids
 - New to the list
 - Relative as well

