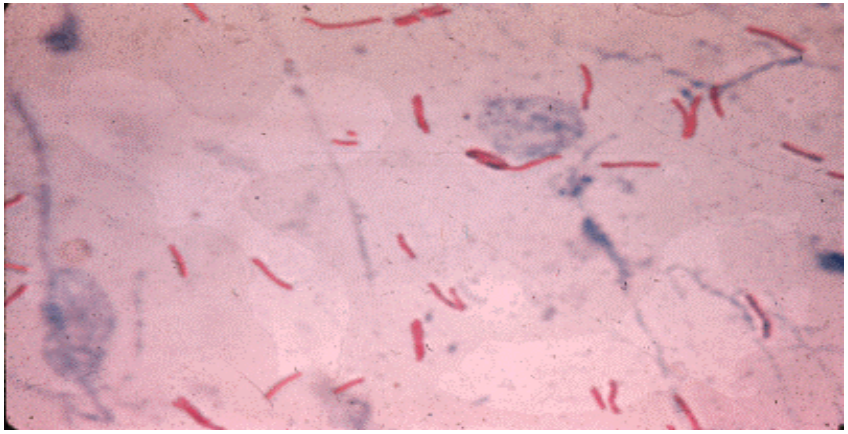
The Non-TB Mycobacteria of Public Health Significance

TB Nurse Conference

December 2009

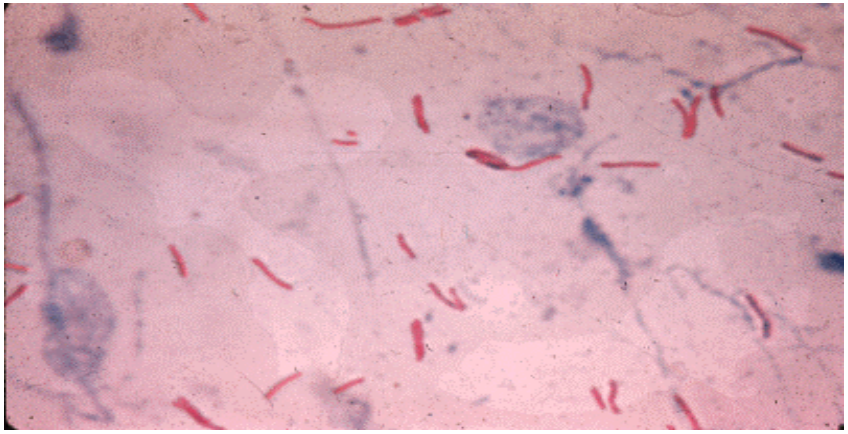
The Public Health World Beyond TB…

What do we do when this…..



….. is not TB ?

How do we deal with the other
~ 90 known mycobacterial species ?



VA Public Health Law and Regulations

- Tuberculosis, active disease
  - Reportable
  - Required public health actions
- Non-TB mycobacterial infection
  - Not reportable, unless
    - Unusual occurrence of disease of public health concern
    - Outbreak (including but not limited to foodborne, nosocomial, occupational, toxic substance-related, and waterborne)
    - Disease caused by an agent that may have been used as a weapon

Infectious Diseases of Possible Public Health Concern

- Transmissible person to person (serious illness, multiple cases)
- Transmissible animal to person (serious illness, transmission to other people)
- Environmental exposure (serious illness, multiple cases)
  - Illness in healthy person
  - Illness in immunocompromised person
- Potential use as BT agent (serious illness, many cases, panic)
- “Scary” – (rare/newly recognized/unknown potential/no treatment available)

Mycobacterial Diseases of (Potential) Public Health Concern

Transmissible person to person	*M.tb*
Transmissible animal to person	*M.tb, M.bovis*
Environmental exposure Illness in healthy person Illness in young or elderly person Illness in immunocompromised person	 *M.avium, M.marinum, M.fortuitum, M.abscessus, M.chelonae* *M.avium, M.kansasii, + many others*
Potential use as BT agent	MDR TB
"Scary" – (rare/newly recognized/unknown potential/no treatment available)	*M.leprae,* ?MDR TB

Non-TB Mycobacteria in Virginia

- How frequent?
- Which ones?
- How serious?
  - Morbidity and mortality
  - Potential for outbreaks
  - Obscure/confuse TB diagnosis

How frequent? How significant?

- How frequent relative to TB?
  - CDC and literature
    - 4 suspect TB cases reported
      - 1 confirmed TB
      - 3 other (NTM or other diagnosis)
- Resources diverted from TB control?
- Adverse effect on patient and family?
  - Medication effects
  - Isolation, economic hardship

NTM Isolates* – DCLS 2009

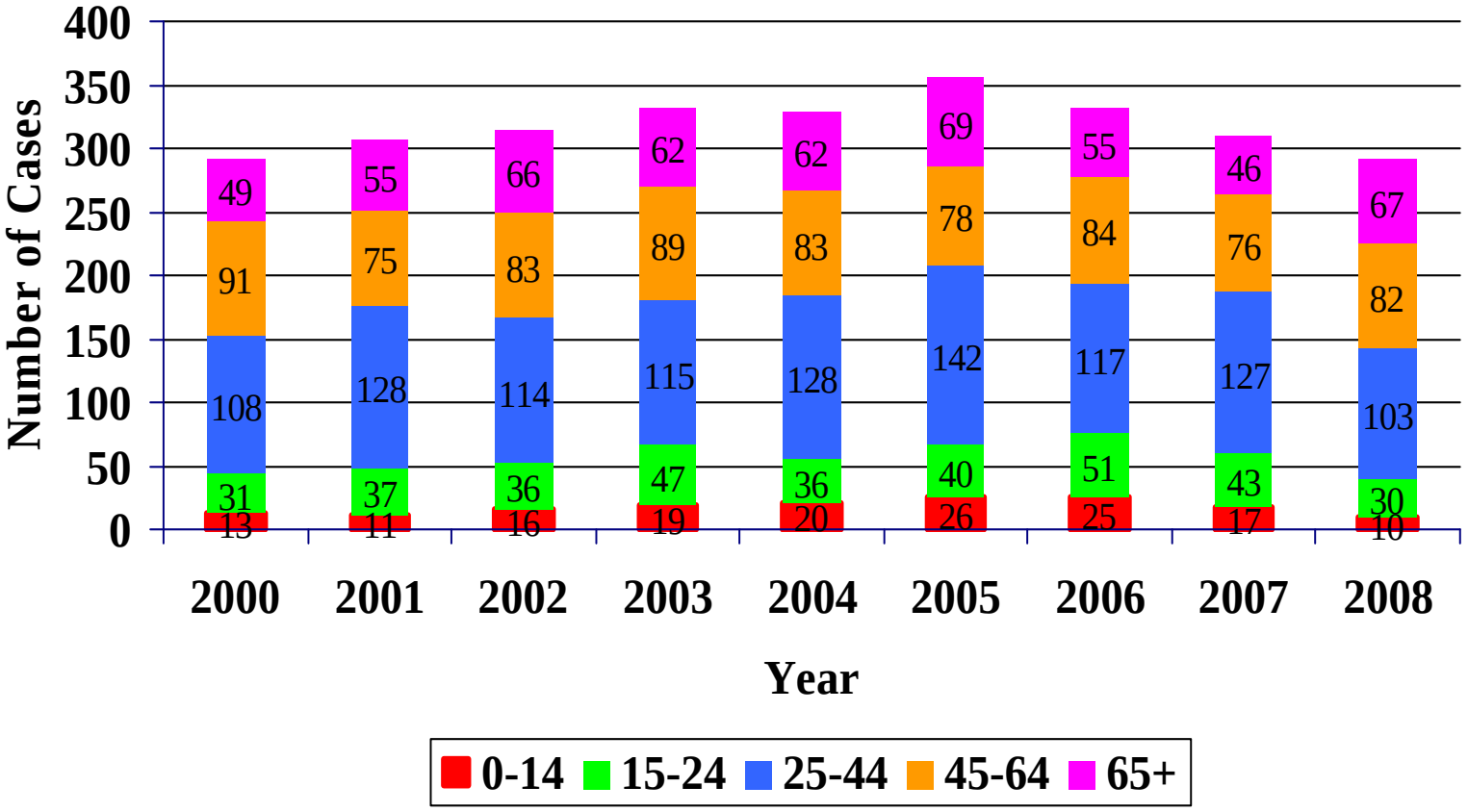
NTM Species	**%**
M. avium complex	60
M. gordonae	13
M. abscessus	6
M. fortuitum	6
M. kansasii	4
M. terrae complex	3
M. marinum	2
11 Others	Each <2%

* n = 545 NTM isolates – 1/1/09-9/15/09

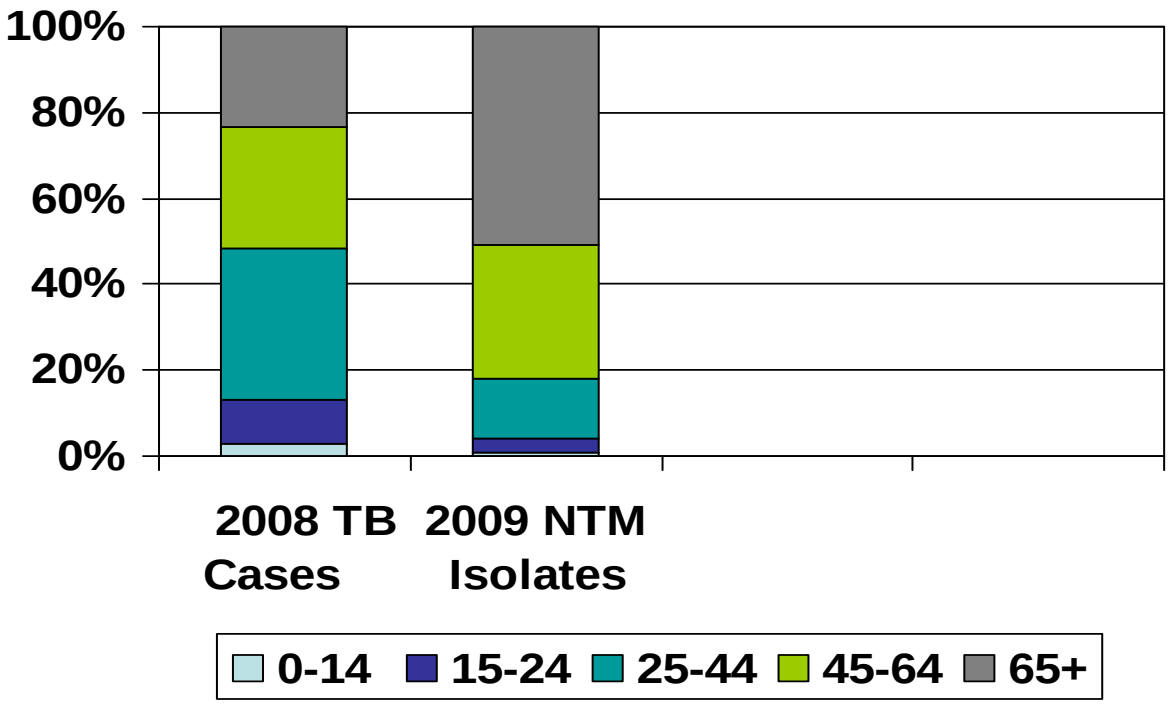
Common Characteristics

- All environmental organisms (water or soil)
- All parts of state represented (rural and urban)
- No obvious seasonal peaks
- Clusters/outbreaks rarely recognized
- Patients older than TB case-patients

TB Cases by Age: VA, 2000-2008



TB vs. NTM – by Age - Virginia, 2008-2009



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M.avium

- Found in water, soil, animals
- Pathogenic for pigs, chickens, turkeys, wild birds, some captive species (zoos)
- Transmission from animals to humans and humans to humans not documented
- Water thought to be major vehicle for human infection
  - Aerosols
  - Exposure to re-circulating hot water systems

M.avium – Common and Challenging

- Colonization vs. infection
  - Multiple positive cultures
  - X-rays consistent
  - Symptomatic
- “Classic” presentations
  - Apical fibrocavitary lesions; middle age, male, smoker, EtOH use – progressive
  - Nodular and interstitial infiltrates (RML common) w/ brochiectasis: elderly, female – very slow progression
- Common (and confusing) presentations
  - Superimposed on underlying pulmonary disease (COPD, silicosis, cystic fibrosis, old TB)
  - Colonization vs. infection difficult to determine
  - May have risk factors for TB
  - Difficult to R/O active TB

M.avium

- Less common presentations
  - Extra-pulmonary disease
    - *M.avium* lymphadenitis in children
  - Disseminated infection
    - HIV, other severely immunocompromised
- Very uncommon presentation
  - Hypersensitivity pneumonitis
  - Associated with contaminated hot tubs

M.gordonae

- Environmental – freshwater, water pipes, faucets, ice
- Rarely a pathogen unless patient severely immunocompromised
- Cause of “pseudo-outbreaks”
  - Contaminated reagents in laboratory
  - Tap water

M.abscessus (and *M.cheloni*)

- Common in Southeastern US
- Occasionally cause pulmonary disease
- Cause skin, bone and soft tissue infection
  - Accidental trauma or surgical procedures
  - Corneal infections
  - Abscesses at injection sites
  - Nosocomial infections (HAI)
- DCLS isolates are from younger patients than *M.avium*

M.fortuitum

- Similar to *M.abscessus/M.chelonae*
- Skin and soft tissue infections
- Associated with contaminated footbaths in nail salons

M.marinum

- Infection follows skin/soft tissue injury with exposure to fresh or salt water (swimming pool granuloma or fish tank granuloma)
- Hand most often affected
- Treatment = antimicrobial agents +/- surgery
- Grows best at 30-33 degrees – tell lab
- Virginia “hot spots” are Northern Neck, Eastern Shore, and Henrico County
- No outbreaks, ? Clusters, ? Public health intervention possible (chlorination of pools, early dx and rx)

Summary

- NTM not usually of major public health interest/concern
- Interesting and challenging organisms and illnesses
- Responsible for significant morbidity/mortality – especially in elderly, immunocompromised, and those with underlying pulmonary disease
- No human to human transmission, but clusters from common source do occur
- Some NTM infections may be preventable (footbath, hot tub, swimming pool and fish tank maintenance; early dx and rx)

References

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