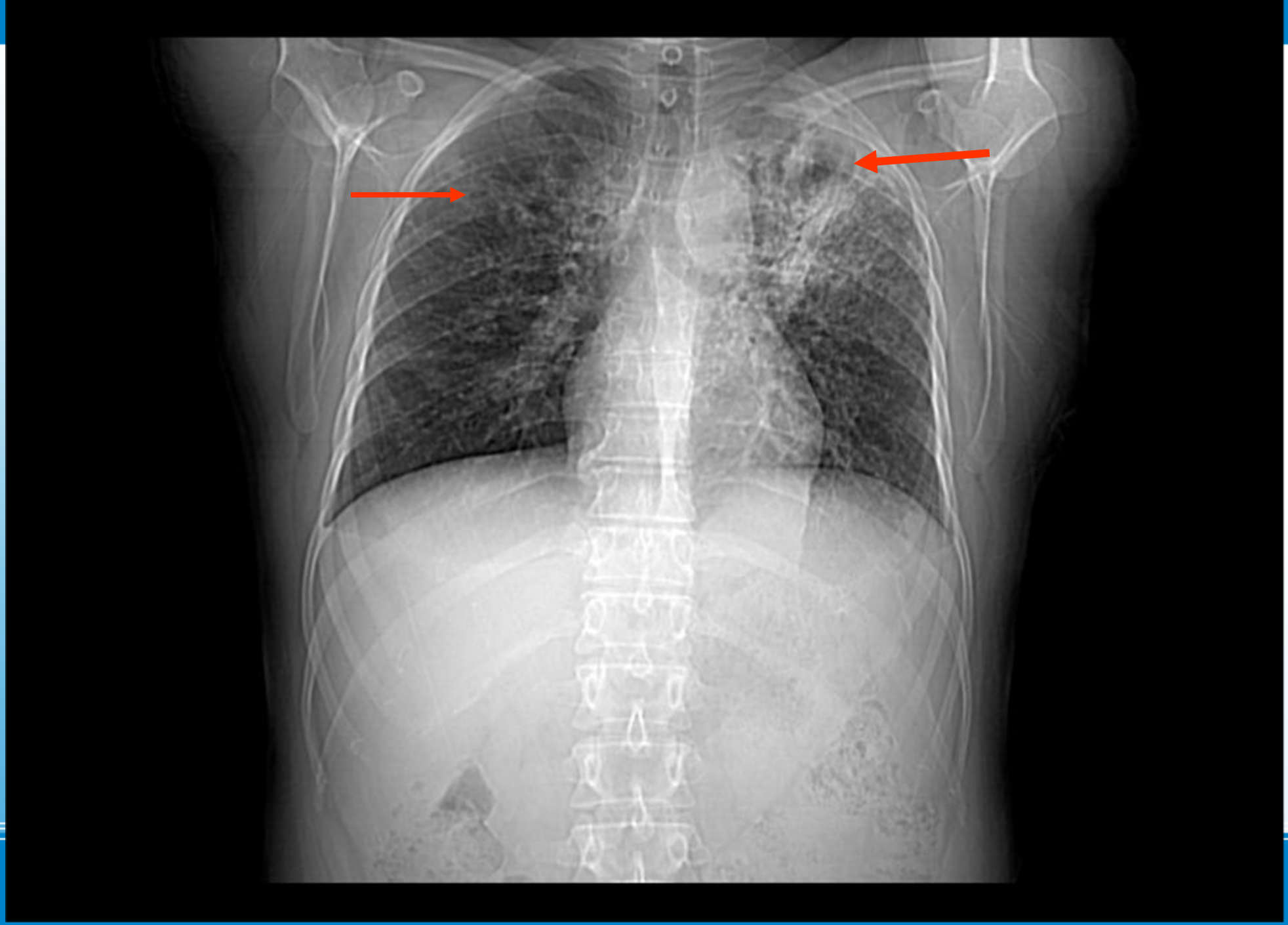
Mycobacterium bovis

Savita Sood R.N./ B.S.N.

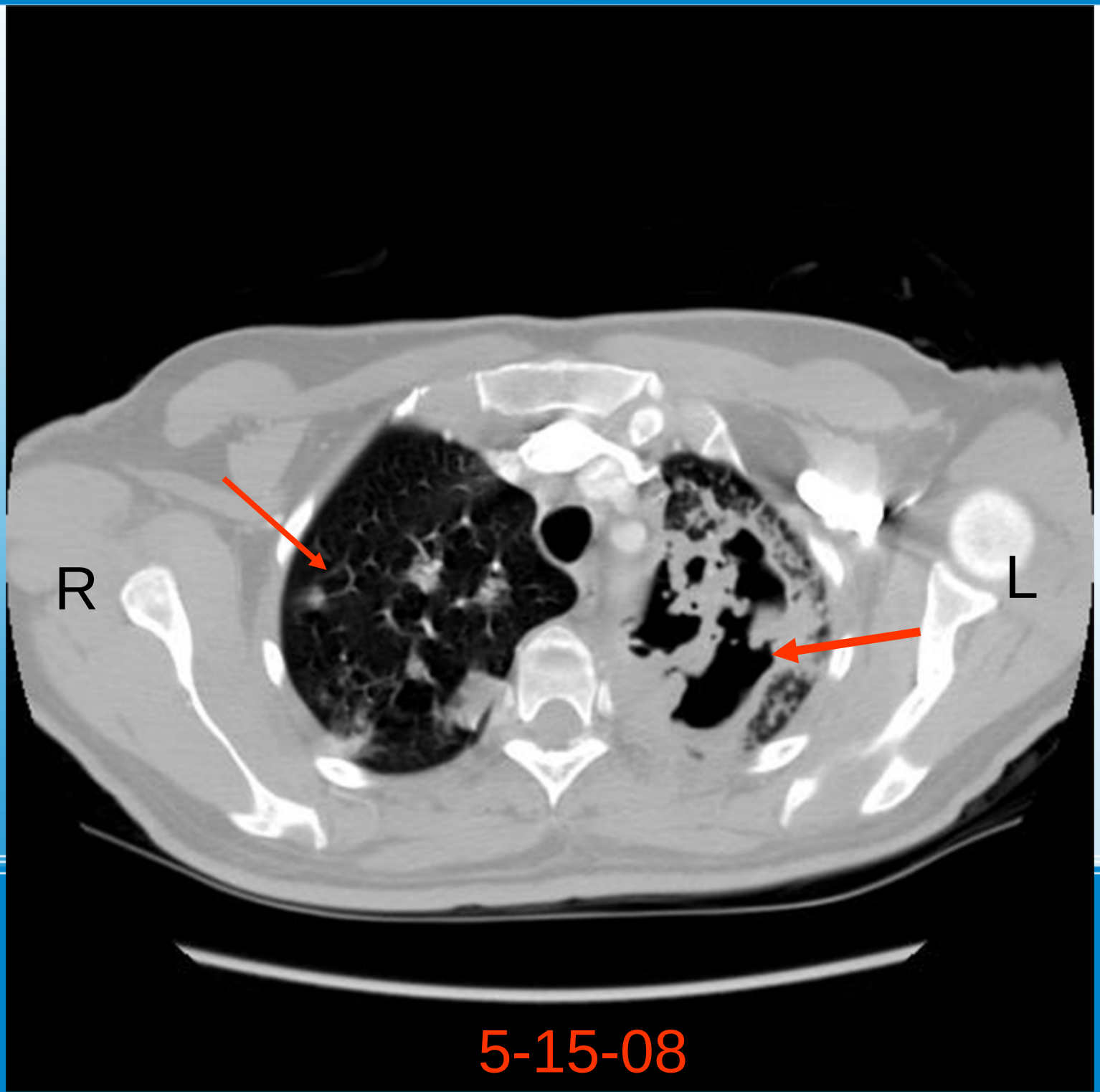
Case History

- AG 47 year old female with Diabetes mellitus
- Born in Mexico, came to US in 2004
- Presented with cough, weight loss of 20lbs and fatigue
- HIV negative
- Cavity in R and L upper lung
- Smears 2+, 4+ and 4+
- Started on RIPE on 5.27.08
- Confirmed as MTC, Resistant to INH and PZA, CDC found it to be sensitive to all first and second line drugs except for PZA (4.10.09)
- CDC confirmation of M.bovis on 2.26.09

Mycobacterium bovis



Initial Film 5-5-08


R
L
5-15-08

- Aerobic bacterium
  - Generation time of 16 to 20 hours.
- Species jumper
  - Jumps from animals to humans
- Mode of transmission
  - Unpasteurized milk
  - Raw or undercooked meat
  - Aerosol droplets
- Species infected
  - Can be found in cattle, deer, monkeys, badgers, elephants, dogs, antelopes, buffalo, camels, ferrets, foxes, moles, opossum, rats

Mycobacterium bovis

Case history:

- From Switzerland
- 72 year old man; farmer
- Presented with pulmonary and renal TB

Transmission:

- Rare to infect from man to cattle
- Cattle to Cattle
- Between different animal species

Int j tuberc lung dis 2004:8;903-904

Mycobacterium bovis-From animal to man and back

Two individuals with M. bovis pulmonary infection, the first consumed raw milk and had contact with cattle

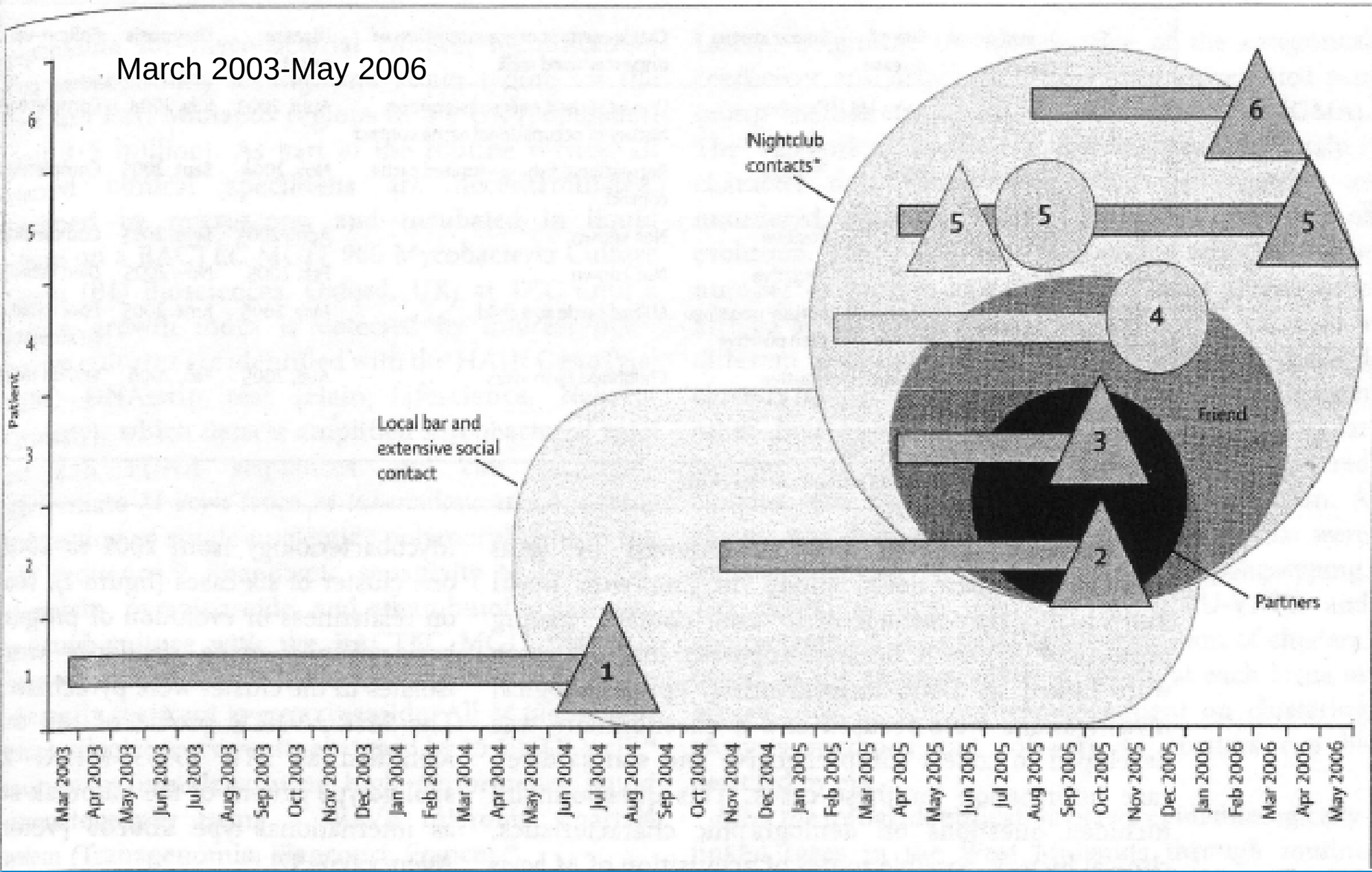
Investigation revealed 4 additional individuals with the same M. bovis infection, but no contact with animals or milk

Five with Pulmonary disease, 2 of these with LN also, one with CNS infection died

Social network united the individuals: night club and a bar

Lancet 2007;369: 1270-76

Person-to-Person Transmission



Evans, J Lancet 2007; 369: 1270-1276

Two siblings residing on a farm, aged 20 and 17

Brother with cavitary disease

Sister with no contact with cattle

Neither with knowledge of drinking raw milk

Cattle had M. bovis infection as did the badgers on the farm

Spoligotyping confirmed same organism in humans and cattle

EID 2004;10:539-541

Spoligotyping

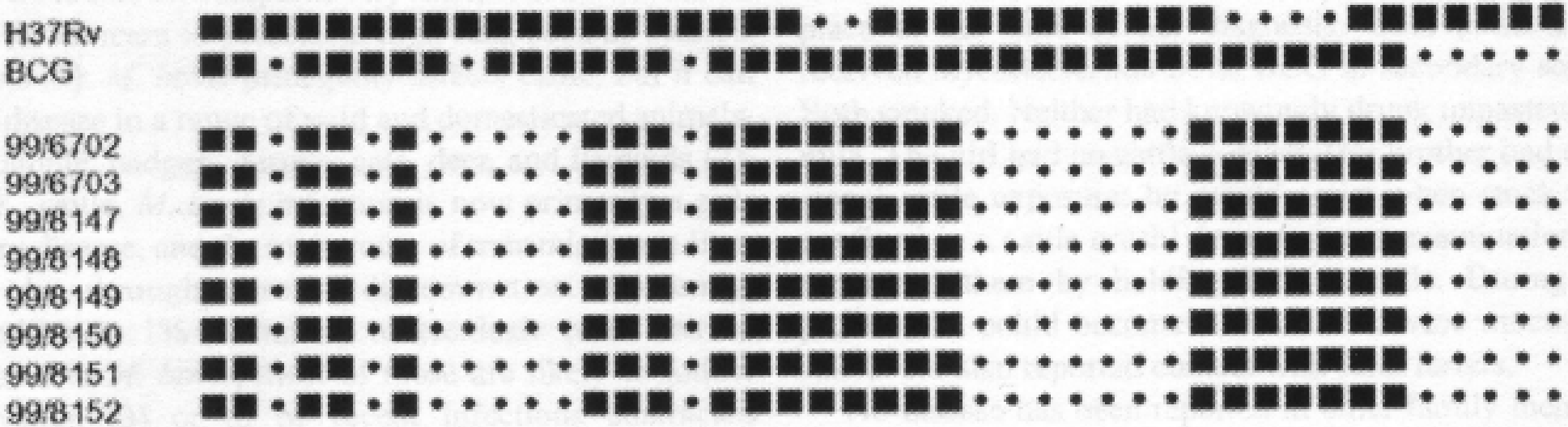


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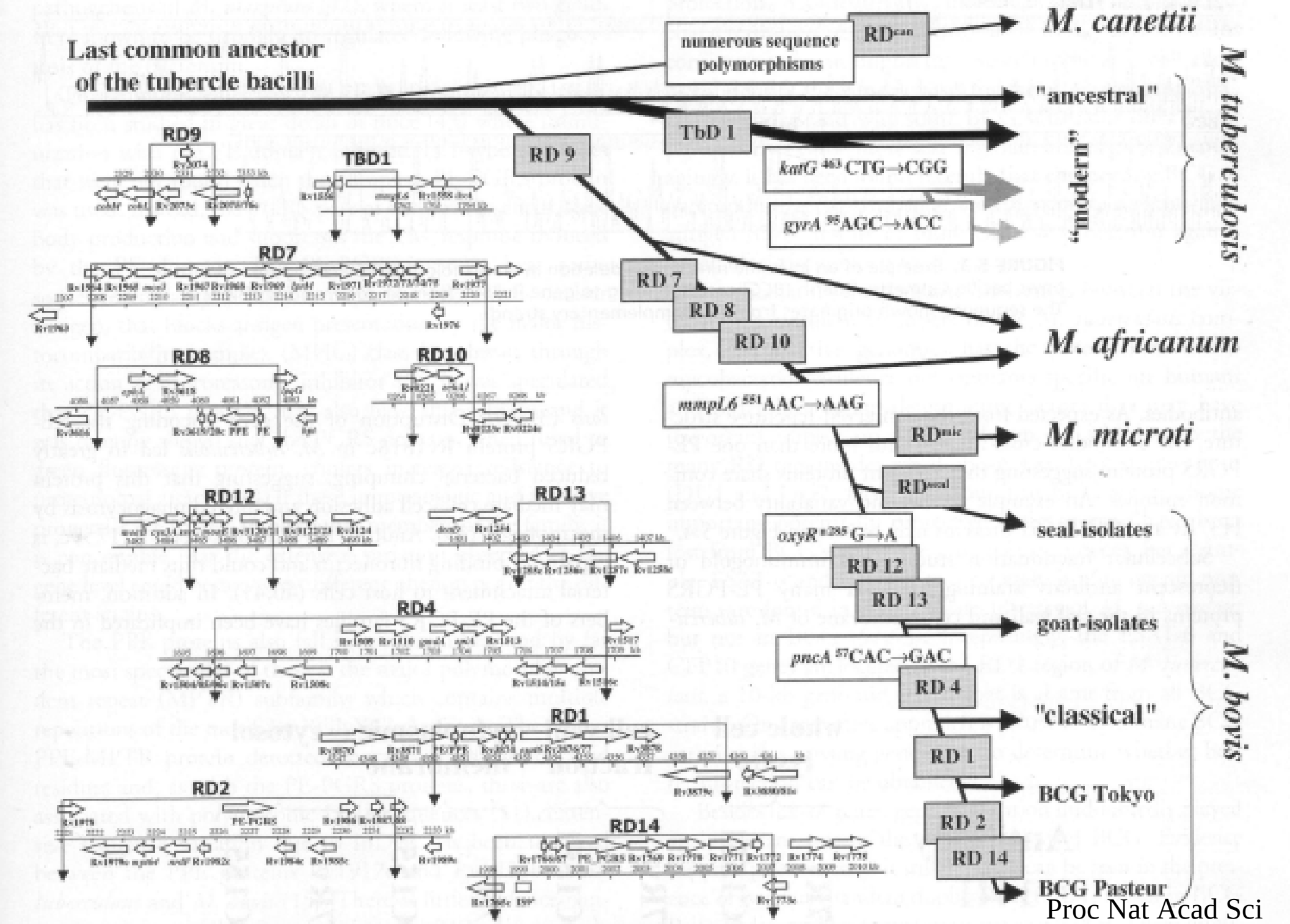
Figure. Spoligotyping profiles for human and cattle cases of bovine tuberculosis. H37Rv and BCG are control strains. 99/6702 and 99/6703 are from the sister and brother, respectively; 99/8147–99/8152 are cattle isolates.

Smith, RMM, EID 2004; 10(3): 539-541

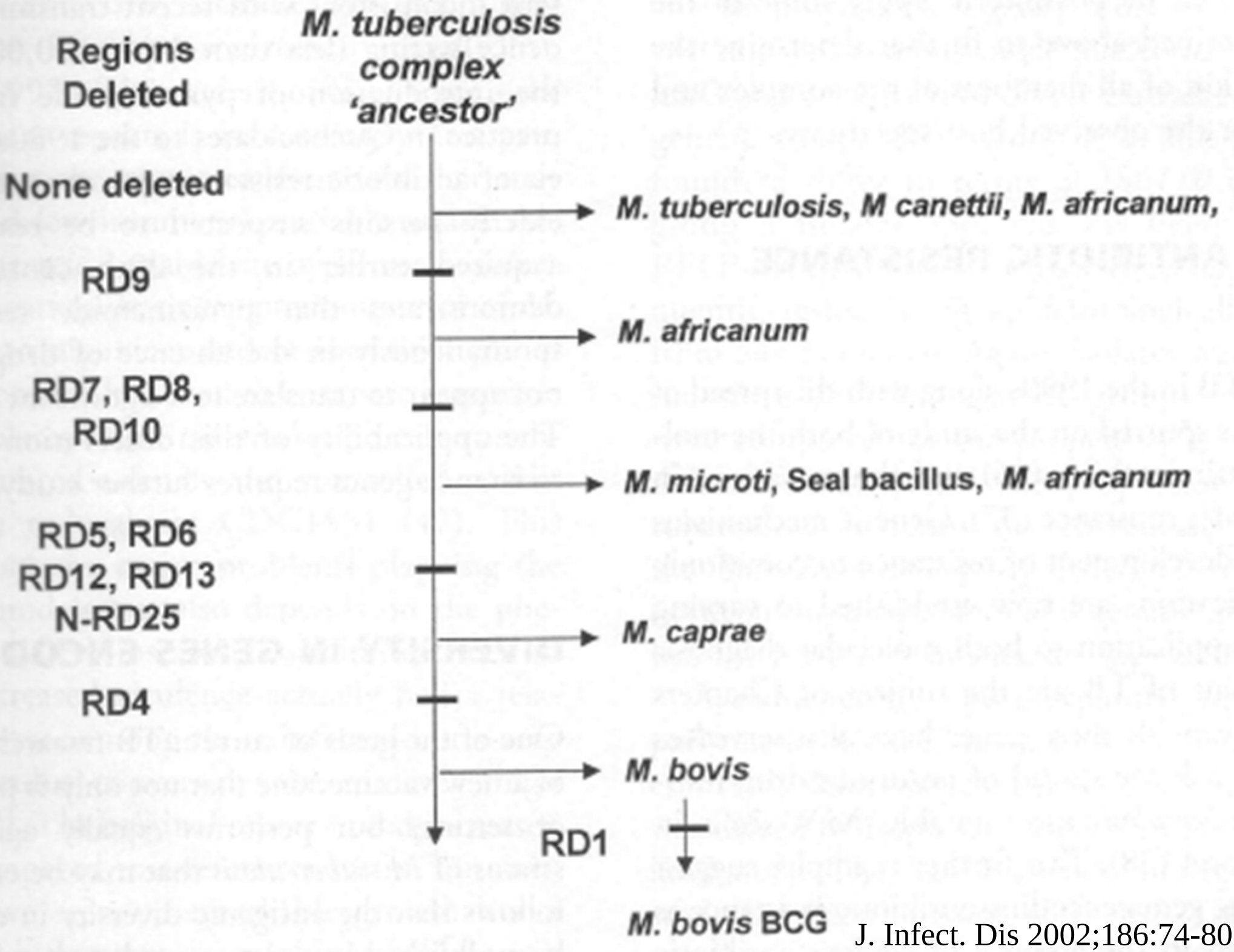
- Evolutionary scenario
  - Myth: Human TB evolved from Bovine TB
  - Fact: Bovine TB evolved from Human TB based on research showing that Bovine TB has a smaller genome

Mycobacterium bovis



RD = region of difference present in *M. tuberculosis*, but absent from some other members of the complex.
TbD1 = region absent from *M. tuberculosis*, but present in other members of the complex.

Proc Nat Acad Sci
2002; 99:3684-89



J. Infect. Dis 2002;186:74-80

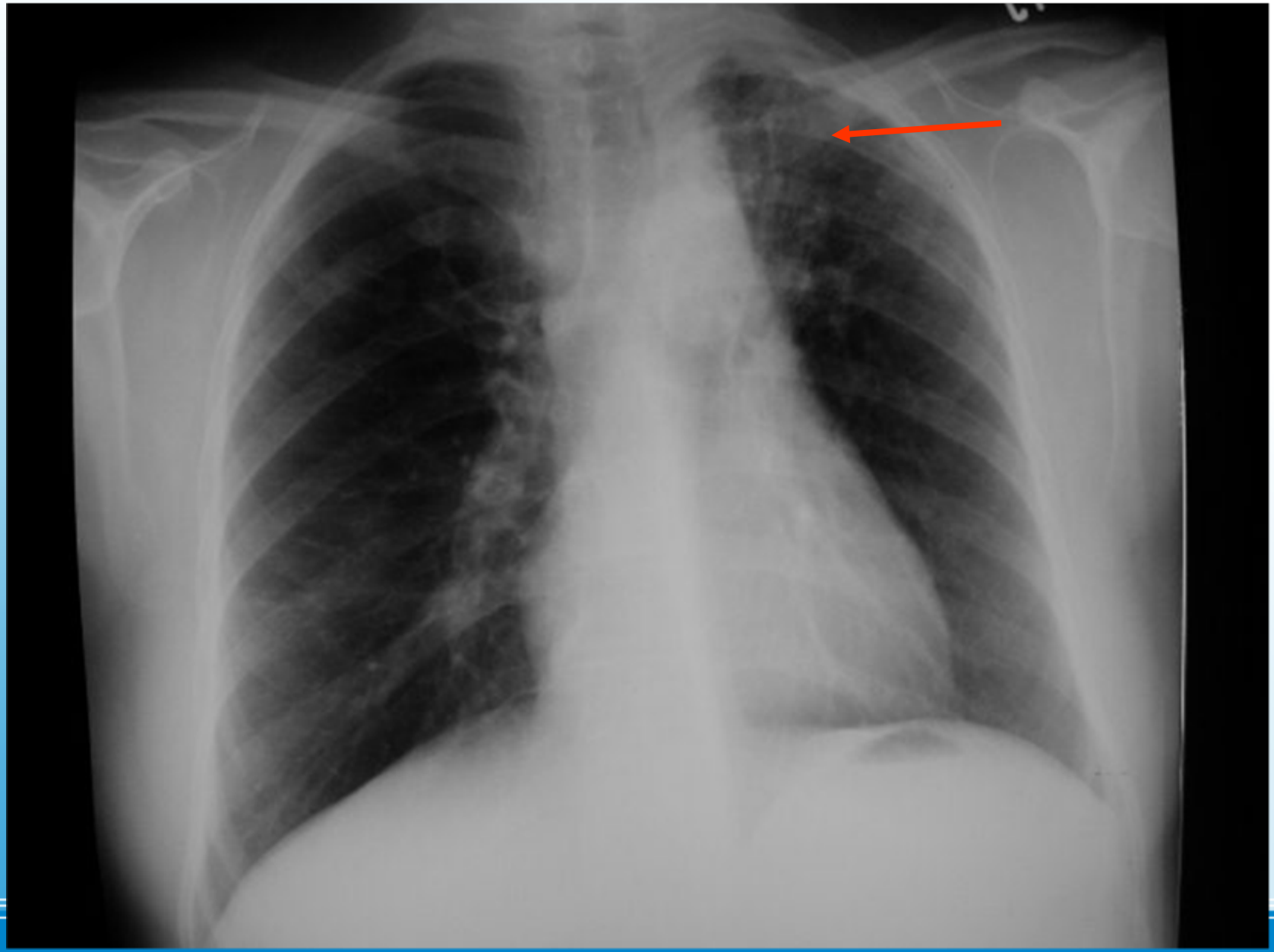
Treatment:

- Resistant to PZA
- Standard treatment of INH, Ethambutol and Rifampin for 9 months

Resistance of PZA

- Due to absence of the pncA gene

Mycobacterium bovis



After One Year of Therapy
M. bovis

- Testing animals for M. Bovis
- Use of pasteurized milk
- Cooking meat thoroughly

Controlling the spread of Mycobacterium Bovis

PZA resistant – Think Bovis

Treatment for 9 months for non cavity illness

Treatment for 12 months for cavity illness

Spread from Humans to Animals to Humans

Summary of Bovis