# TB Genotyping and Impact on Determining Transmission

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# Definition of Genotyping TB:

- “DNA Fingerprinting” of the TB specimen that can link the TB genetically into certain groups.

# Brief Explanation about TB Genotyping.

- In Virginia at least one culture positive sample from every TB case is sent to a Genotyping Lab (Universal Genotyping).
- **Non-matching Genotypes** provides strong evidence that the TB cases are **NOT** related in the same chain of recent Transmission.
- **Matching Genotypes** provide evidence of Possible Linked Recent TB Transmission.

# What Does it Mean if there are Matching Genotypes?

- If the Genotypes Match we say the cases belong to the same "**Genotype Cluster**"
- We (Public Health Workers) should investigate for known Epidemiological Links.
- If there is a genotype and Epidemiological Link  the patients are said to belong to the same "Epidemiologically Confirmed Genotyping cluster"
- Finding Confirmed Clusters Provide a Number of Possible Benefits in TB Control.

# Case Study: First Linked Cases:

- March 2010: FCHD received report of two TB cases **uniquely genotype-related**.
- Both Cases have TB Sx that start about Feb of 2008. both begin Tx for TB disease late spring 2009. Both Smear Neg. Pulmonary TB.
- No previous epidemiological Links identified between the two Cases prior to genotyping information..
- These are Cases “A” and “B” (Our TNF-alpha Cases)

# Case Study, Initial Linked cases:

- Cluster Investigation Found: Both Cases with “Auto-immune” Diseases; Both went to the same Rheumatologist office. Both had received TNF-Alpha Blocker agents.
- Rheumatology Office did not provide Evidence of clients being in Office on Same Day. . .
- No Other Epidemiological Links Identified.
- So: They are genotype-related with *Possible* Epi Links.

# Case Study: Three New Linked Cases:

- June 2010: S. Keller reports to FCHD that three additional TB cases found to be uniquely genotype-related!!
- One Case, Case “C” sticks out: Sx started “summer of 2008”, Severe Cavitary, 4+ smear TB Disease; He is Vietnamese and says, that he is an out-of-work car mechanic.
- Case “C” Provides No contact investigation information – Ever. But ORW of Same country of Origin recalls giving Case “C” a ride in Dec. 2009.

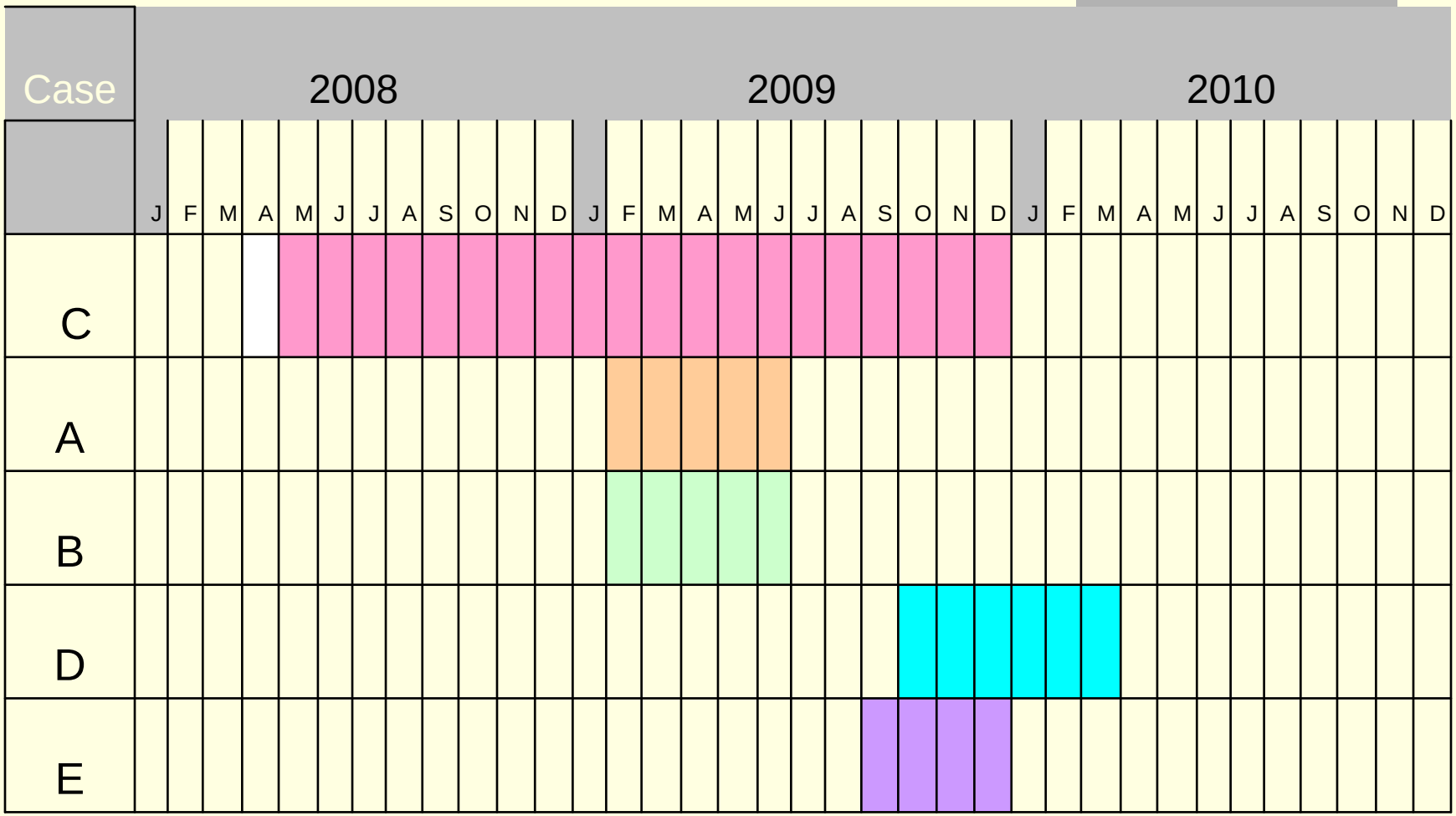
# Three Additional Linked cases:

- ORW from Vietnam recalls giving Case “C” a ride in Dec. 2009. Case C appeared to be a mechanic and needed a ride.
- Other Two Cases, Cases “D” and “E” have marked similarities in onset of Sx (Dec 2009 – Jan 2010), smear and disease status (Both smear neg and both pleural).

# Three Additional Linked cases continued:

- Time to re-interview everyone in the Genotype-related cluster.
- Cases “D” and “E” recall picking up a “Vietnamese Mechanic” and giving him a Ride Summer and Fall of 2009!
- Case A provides no evidence of epidemiological Link to other Cases
- Case B Can not be found for Cluster Investigation Re-interview.

# Likely Infectious Period for Each Case:



# Conclusion and Lessons Learned:

- TB Transmission and Infection Can Occur in Short Time Frames Under Certain Conditions (Very close contact in a car, very sick case)
- Genotyping will greatly improve our efforts to find contacts not previously found especially transmission in different jurisdictions, with unsuspected or unusual transmission settings.
- Need to try to keep reliable contact information with TB clients even after completion of treatment