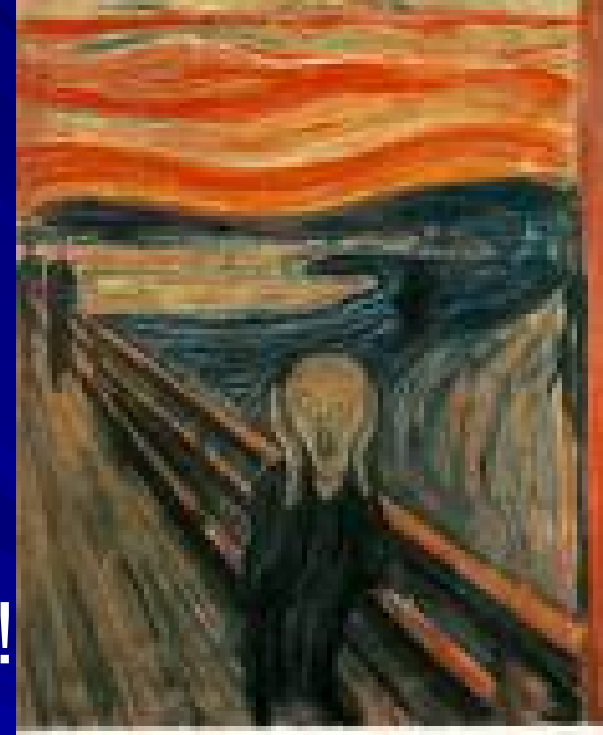# Fundamentals of a Contact Investigation-Part I
…so many questions to answer

Vernard D. Green AA, BS, MSPH, SPHA/CDC

Complex Questions

- Who is suspect?
- Infectiousness?
- Which contacts to evaluate?
- Where do I start?
- So many questions to answer!

Objectives

- Define contact investigation (CI)
- Describe the purpose of the CI and its importance for preventing transmission
- Describe when a CI should be conducted and how it should be prioritized
- Describe communication techniques which will be helpful in the TB interview

Contact Investigation Defined

A procedure for identifying contacts; people exposed to someone with suspected or confirmed pulmonary TB disease, screening those individuals for TB infection and disease, and providing appropriate treatment

Importance

- CDC estimates that 9 contacts are identified for every verified pulmonary and laryngeal TB case in the US. Of those:
  - 25-30% are infected with TB
  - 1% of infected contacts have already progressed to TB disease
  - 10% of newly infected contacts will develop TB disease-5% within 2 years
  - Contacts coinfected with HIV have a 7-10% chance per year over a lifetime for developing TB disease

National Objectives

- Contacts will be identified for 100% of newly reported sputum smear positive cases
- 93% of contacts to sputum smear positive cases will be evaluated for infection and disease
- 88% of infected contacts who are started on treatment for LTBI will complete therapy
- 79% of contacts to sputum smear-positive TB patients started on treatment for newly diagnosed LTBI will complete treatment

Michigan Contact Follow-up 2007

	Sputum smear +	Sputum smear -, cult +
Cases for investigation	75	27
Number of contacts/case	1,368	54
Evaluation rate	82% 1,125	76% 41
TB disease	21	2
LTBI	15% 173	17% 7
-tx rate	65% 113	100% 7
-completion rate	69% 78	71% 5
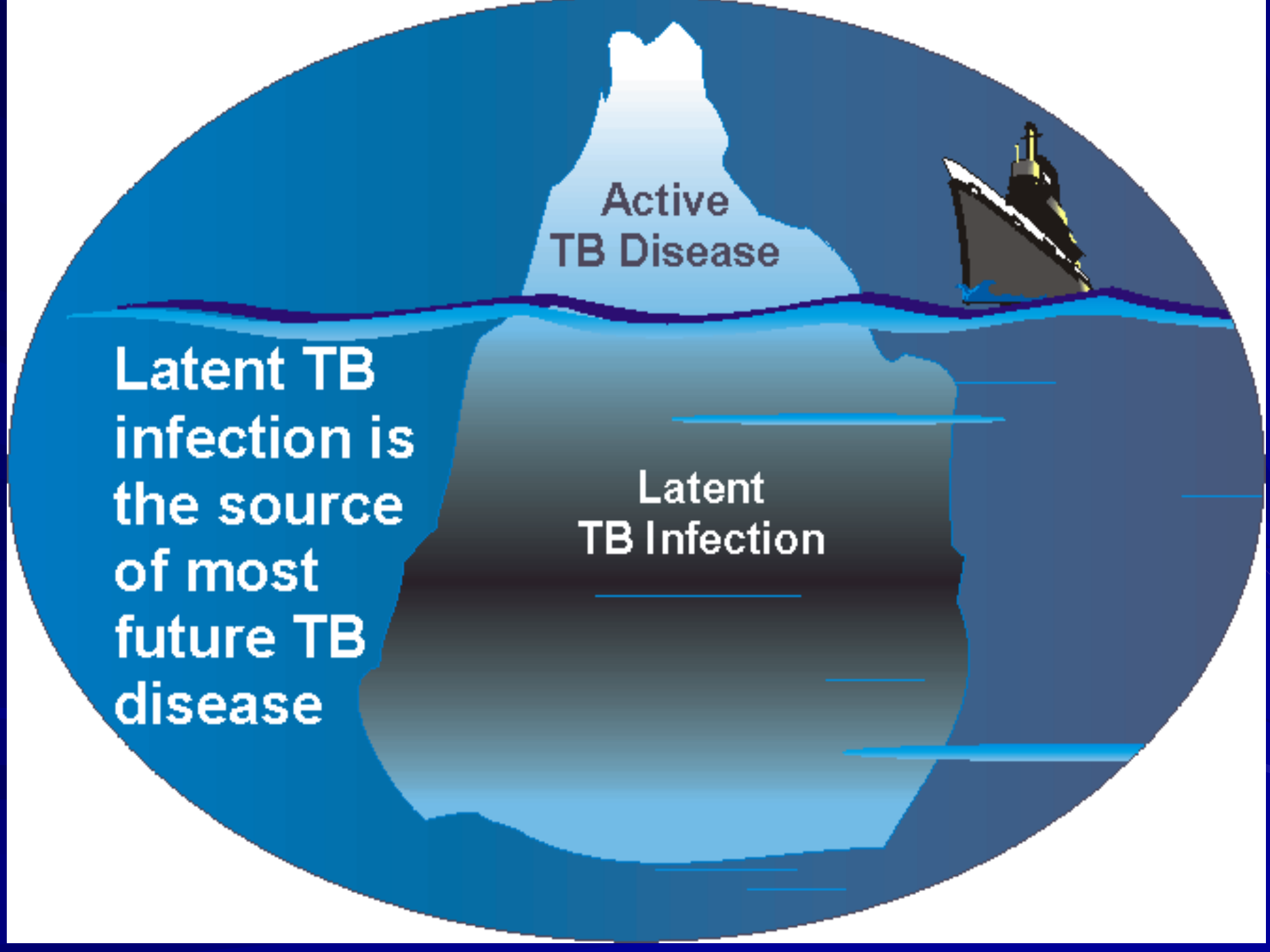
Opportunity Missed

- *All* cases of Tuberculosis were once contacts.

TB Control Priorities

- Cases
  - Identifying and treating persons who have active disease
- Contacts
  - Finding and screening contacts of active cases to determine whether they are
    - Infected or
    - Have active disease
  - Providing appropriate treatment

TB Control Priorities

- Screening Risk Groups
  - Screening populations at high-risk for TB infection and disease to detect infected persons, and providing therapy to prevent progression to active TB

Prioritizing Contact Investigations

- **Priority One**
  - Pulmonary or laryngeal disease with +smear
  - Disease in children
  - Pulmonary disease with HIV
- **Priority Two**
  - Pulmonary disease diagnosed clinically/no microscopy
  - Significant tuberculin reaction or recent conversion in children
  - Pulmonary disease with – smear/+ culture
- **Priority Three**
  - Extrapulmonary disease only if there is aerosolization

Contact Investigation Steps

- **Establishing Investigational Priorities**
  - Establish priorities based upon
    - Transmission risk assessment
    - Host risk
    - Concentric circle approach
  - Contacts who are HIV infected or are young children receive highest priority!!!

"Contact investigations are to be active and imaginative, Sherlock Holmes pursuits."

David Glasser, MD

May, 1974

Interview Defined

An interview is an individualized *exchange* of information

Information flow is two way

A dialogue – not a monologue

Open Ended Questions

- Require more than one-word response to promote dialogue
- Classic question starters are:
  - Who
  - What
  - Where
  - When
  - Why
  - How

Open Ended Questions

- Questions such as:
  - Do you visit anyone?
  - Do you have friends and family?
- Would be better as:
  - Tell me about your hobbies and activities.
  - Who are your friends and family?

Close Ended Questions

- To guide a conversation in a useful direction
- Can provide a challenge to the client through assumptions and reinforcement
- Provide quick summation

Interviewing Techniques

- Focused questions-provide limits or boundaries
- Paraphrasing-rewording response to verify information and show active listening
- Reflection-rewords a response to include emotional response
- Summarizing-rephrasing a series of responses to verify information and show active listening

Interviewing Techniques

- Ask/look for patient feedback (body language, questions, need for clarifications)
- Explain why certain questions are asked especially sensitive questions
- Be open to patient's own explanations/beliefs of illness
- Be aware of illness experience
- Avoid use of medical terminology
- Use open-ended questions as dialogue permits

Health Education

- Why must we do health education?
  - Vestment in treatment
  - Trusting relationship
  - Accountability for health decisions
  - Health care team included patient
  - Informed consent

Cultural Competency

- Health care workers should be aware of cultural diversity in everyone, but not necessarily the stereotypes
- Diversity categories

  Geography   Culture   Gender

  Spirituality   Language   Disability

  Sexuality   Age

Culture Can Affect the Following

- Experience of psychological distress
- Description of symptoms of distress
- Communication about distress and its symptoms
- Attribution of illness source
- Attitudes towards helpers
- Expectations for treatment

Contact Investigations for Tuberculosis-Part II

By
Vernard D. Green AA, BS, MSPH, SPHA/CDC

Slides courtesy of ALAM and MI-ACET

Objectives

- Describe how to conduct contact investigations and identify data that should be collected

- Identify common barriers to contact investigations and management of contacts

Contact Investigation Steps

1. Initiation
2. Data collection
3. TB transmission risk assessment
4. Contact field investigation
5. Establishing investigational priorities
6. Medical evaluation of close contacts
7. Evaluate need to do further testing based on infection rate
* Initiate TB-GIMS cluster data (epi-Links)
8. 3 month follow-up of close contacts
9. Reevaluate need for further testing based on infection rate
10. Contact investigation report

Contact Investigation Steps

- Initiation
  - Start investigation with interview within 1 working day of case report for infectious persons, 3 working days for others
- Data Collection
  - Medical record review
  - Case interview
  - Contacts identified

Medical Record Review

- Date of birth
- Disease site
- Bacteriology results
- CXR results
- Symptoms/duration
- Social worker's notes
- Demographic data

- HIV status
- PPD results
- Previous history of TB
- TB treatment regimen
- Establish infectious period
- TB-GIMS cluster data analysis

Establishing an Infectious Period

- Use 3 months before TB dx as beginning
- Ends after 3 consecutive negative sputum specimens and 2-3 weeks appropriate treatment
- May find that a more conservative estimate is appropriate in some situations

Contact Investigation Steps

- Case interview
  - Establish rapport and trust-confidentiality
  - Elicit duration and location of exposure
    - Home
    - Work/school
    - Leisure
  - Obtain locating information
    - Demographic
    - Risk factors

Contact Investigation Steps

- Case interview (cont.)
  - Environmental information
  - Frequency and duration of episodes sharing air space
  - Provide TB education
    - Use open-ended questions!!!

Contact Investigation Steps

- TB transmission risk assessment
  - Person factors
  - Time factors
  - Place factors
  - Host factors

Infectiousness Factors

Person
Index case and contact

Time
Duration and frequency

Place
Air circulation, proximity, etc
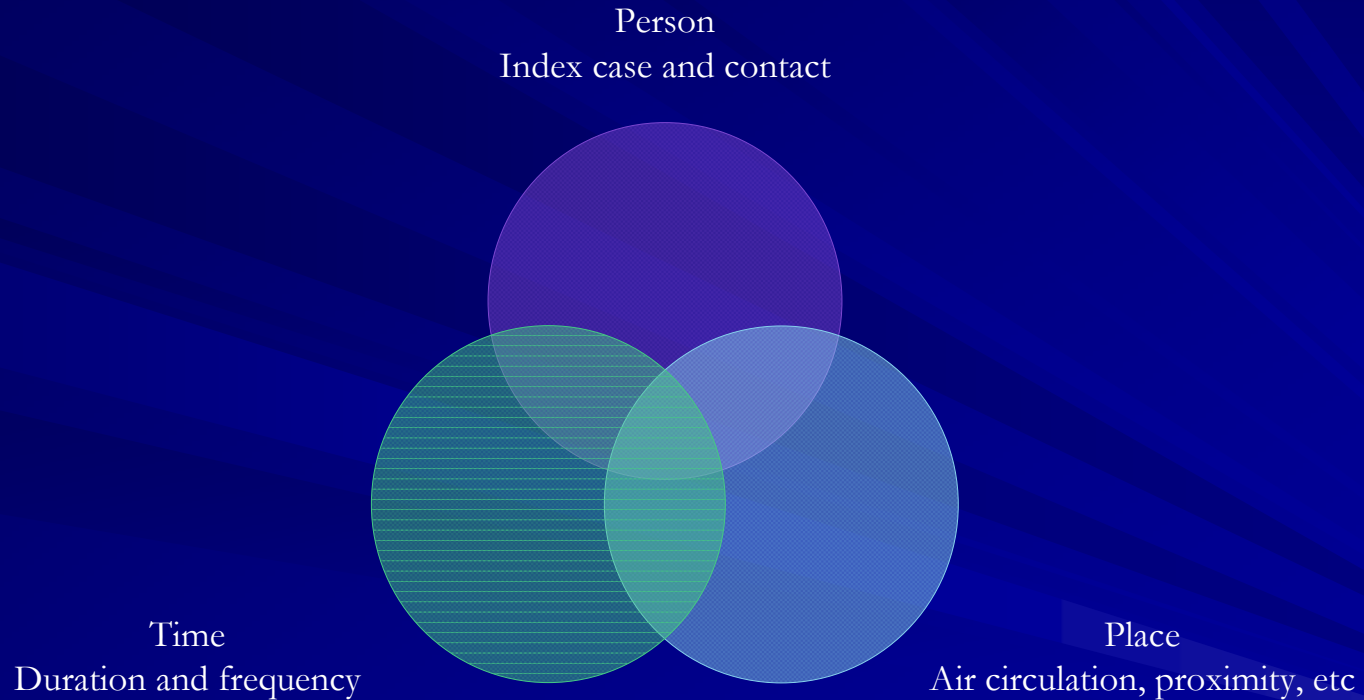
Person

- **Laboratory results**
  - Positive AFB smear
    - Rare-possibly infectious
    - Few-probably infectious
    - Numerous-probably very infectious
    - IGRAs/DNA probe conformation MTB
  - Remember a +AFB smear is not conclusive for *M. tuberculosis;* it simply means that there are mycobacteria in the specimen.

- **Clinical indicators**
  - Coughing, sneezing, producing sputum
  - Length of symptoms
  - Length of time on anti-TB medication
  - Chest x-ray

Person
Likelihood of Disease Transmission

Clinical Data	Higher	Lower
TB disease location	Laryngeal/ pulmonary	Extrapulmonary
Smear status	Positive	Negative
Smear source	Spontaneous	Induced or clinical
Chest x-ray	Cavitary disease	Non cavitary
PPD result **QuantiFERON TB-Gold T-Spot**	Large >15mm Positive Positive > 8 spots	Small <15mm Negative or Ind. Negative 0-4 spots Equivocal 5-7 spots
Symptoms	Cough	No cough

Place
Environmental Indicators

- Circulation of air
- Length of time in the environment
- Size of the facility
- Location of the index case within the facility
- Infectiousness of the patient

Place
Likelihood of Disease Transmission

Factor	Higher	Lower
Volume of air common to case/contacts	Small	Large
Adequacy of ventilation	Poor	Good
Recirculated air	Yes	No
Upper room UV light	Not present	Present

Time

- Duration of exposure indicators
  - Length of time an exposed individual was in contact with the contagious index case

- Host factors
  - Higher risk of disease if infected
    - Immunocompromised
    - Young children
    - Other medical conditions

Host Factors

- Certain contacts have higher risk of TB disease if infected:
  - Immunocompromised
  - HIV infected
  - Young children
- Re-infection possible
  (especially immunocompromised)

Contact Investigation Steps

- Contact field investigation
  - Home visit essential!

Contact Investigation Steps

– Purpose of field visit

- Further interview TB case
- Interview and skin test contacts
- Observe contacts for TB symptoms
- Identify health care sources/make referrals
- Identify additional contacts
- Educate contacts about TB/purpose of CI
- Observe environment for potential transmission factors
- Assess contacts' psychosocial needs and other risk factors

Contact Tracing

- **Skills necessary**
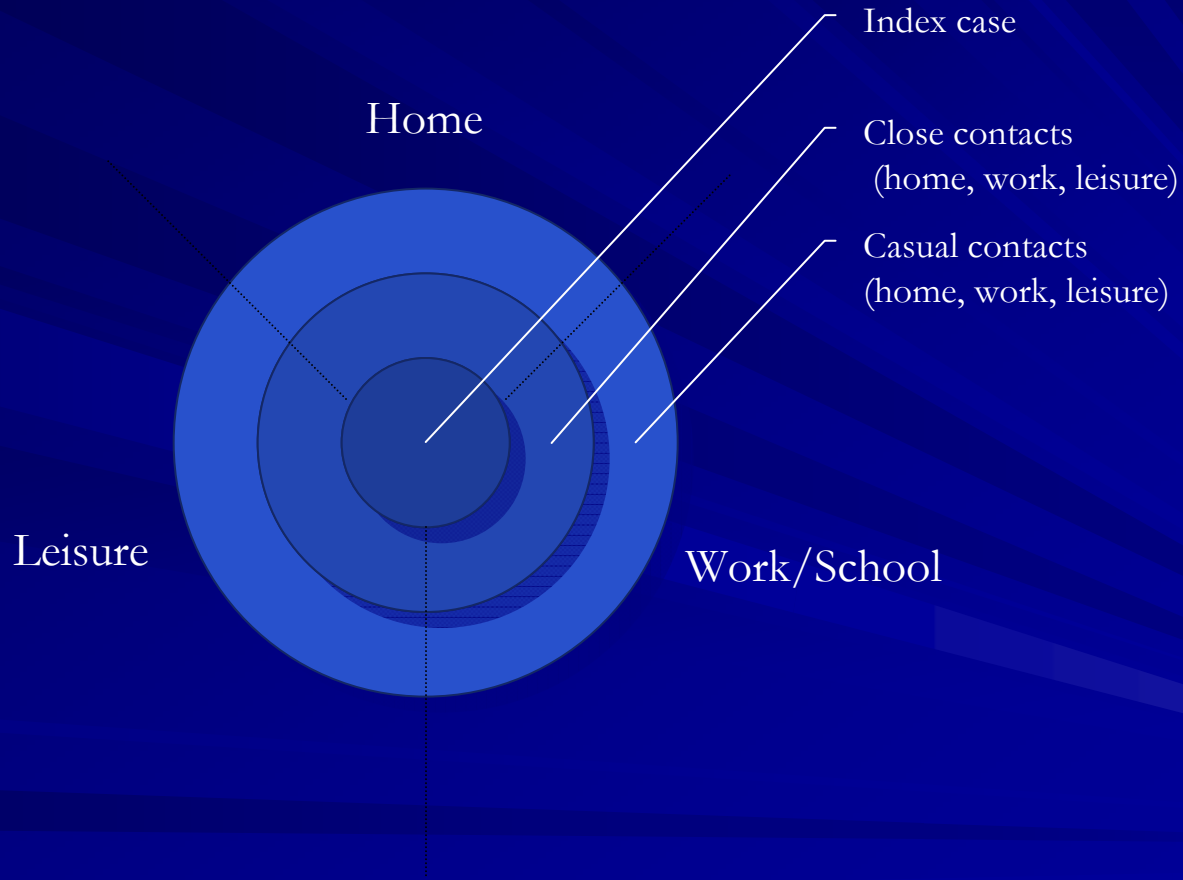 - Assessment
  - Interviewing
  - Counseling
  - Evaluation

Contact Investigation Steps

- Establishing Investigational Priorities
  - Priorities for index case based on characteristics
  - Priorities for contacts
    - Age
    - Immune status
    - Other medical conditions
    - Exposure
  - Contacts who are HIV infected or are young children receive highest priority!!!

Historical Perspective
Concentric Circle Method of Investigation

Index case

Close contacts
(home, work, leisure)

Casual contacts
(home, work, leisure)

Home

Leisure

Work/School

Contact Investigation Steps

- **Medical Evaluation of Close Contacts**
  - Mantoux skin testing-read in 48-72 hours
    - Follow-up for:
      - Skin test positives
      - Skin test negatives who are children, adolescents or HIV+

      Follow-up consists of:
      - Medical evaluation/CXR (sputum specimens as indicated)
      - Treatment for LTBI

      Note: QuantiFERON TB-Gold or T-Spot (IGRAs) recommended evaluation of contacts, 24hrs for results.

Contact Investigation Steps

- Evaluate need to do further testing based on priorities
- Follow-up skin testing after 8-10 weeks

Infection Rate

- CDC estimates that 5% of the U.S. population will test positive to Mantoux test.
  - Test higher priority contacts first
  - Extent of recent transmission
- Factors to consider:
  - Population
    - Foreign born

Contact Investigation Steps

- Re-evaluate need to do further testing based on priorities and extent of recent transmission
- Contact investigation report
  - Summary of the presenting case
  - Number of negative, newly positive, previously positive, and documented conversions
  - Persons with abnormal CXR, suspects, or new cases
  - Number placed on treatment of LTBI

Barriers to Investigations and Management of Contacts

- **Identifying the contacts**
  - Information that is necessary
  - Encouraging the recall of the case
  - Using the contacts themselves as a resource
  - Using open-ended questions
  - Reviewing information with each visit

Barriers to Investigations and Management of Contacts

- Finding the contacts
  - Available resources to search
  - Time line for searching
- Involving the contacts in the process
  - Using culturally-sensitive material
  - Interpreters
  - Maintaining a non-threatening approach
  - Adapting to their lifestyle and time constraints
  - Identifying their anxieties and fears

Barriers to Investigations and Management of Contacts

- Skin testing procedure
  - Teaching and sharing information
  - Reviewing, reviewing, reviewing
  - The importance of the scheduled return time
- Providers
  - Finances
  - Medical providers
  - Language issues
  - Work schedules/transportation issues

Additional Resources

- Centers for Disease Control and Prevention. Interactive Core Curriculum on Tuberculosis: What the Clinician Should Know. Centers for Disease Control and Prevention: Atlanta, GA; 2004. (print publication under revision and due to release Dec 2009)

- Centers for Disease Control and Prevention. Self-Study Modules on Tuberculosis: Contact Investigations for Tuberculosis. Centers for Disease Control and Prevention: Atlanta, GA; 2008.

- Performance Guidelines for Contact Investigation: The TB Interview. New Jersey Medical School National Tuberculosis Center (http://njms2.umdnj.edu/globaltb/audioarchives/basicinterviewing.htm)

- Centers for Disease Control and Prevention. Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis. MMWR *Recommendations and Reports* December 16, 2005 / 54(RR15); 1-37.