

TB Assessment & Treatment in Elderly Patients

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Case Summary

65 yo Korean mathematics professor

- Minimal productive cough x 6 weeks
Denied fever, chills, night sweats, weight loss, hemoptysis
- Primary MD: 2 weeks levofloxacin, sl improvement;
- Still swimming at community pool daily x 30 min

PMH: Active TB in Korea during 1950s

- ~1 year treatment, multiple drugs
- CXR persistently abnormal since

SH: Father also had active TB, alive/well at 88 yo living in LA.

Exam: Thin, fit appearing male

Data: AFB x 3 sent 4 weeks ago - smear & culture no growth

Several CXR reports past 6 weeks - chronic “old TB scar”,
consider bronchiectasis

65 yo Korean Professor--Sample CXRs



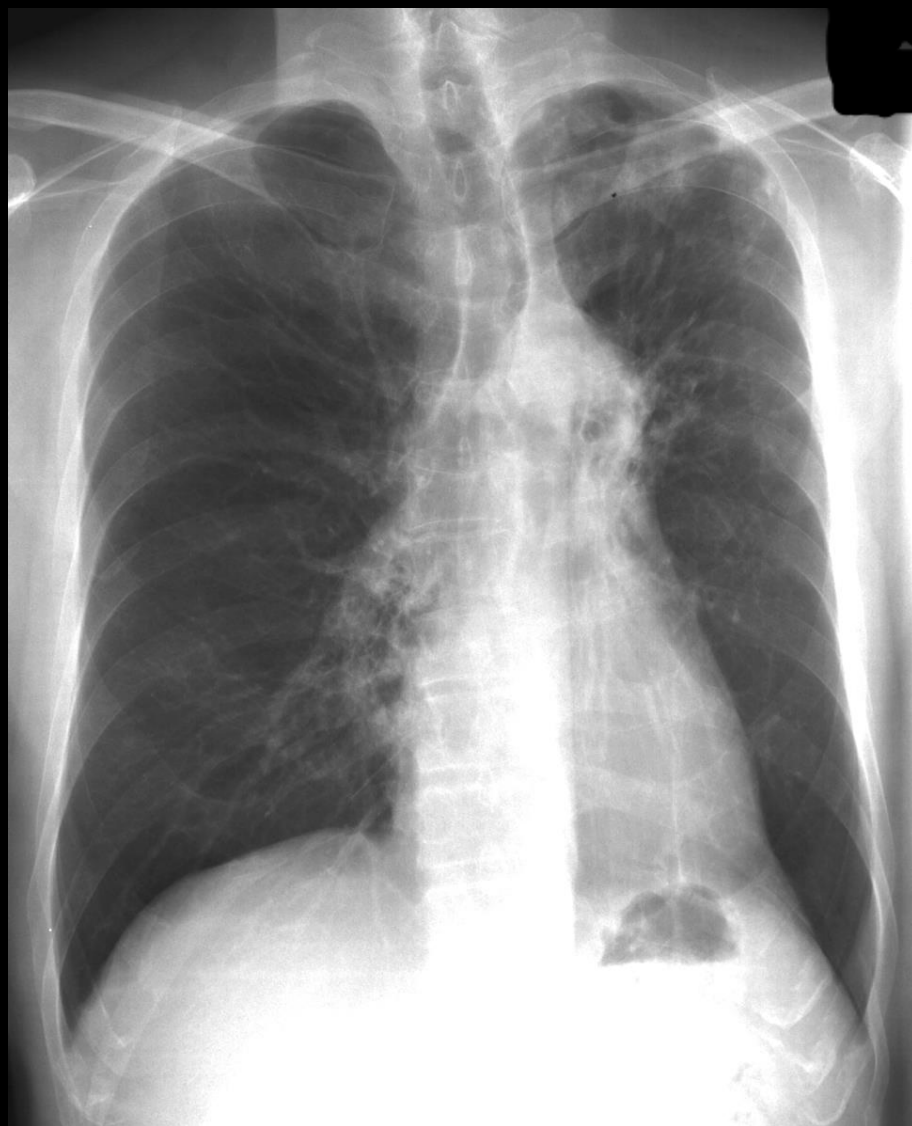
**What would you do
now?**

**Family helped be dig up chest
x-ray from 20 years prior**

65 y.o Korean Professor



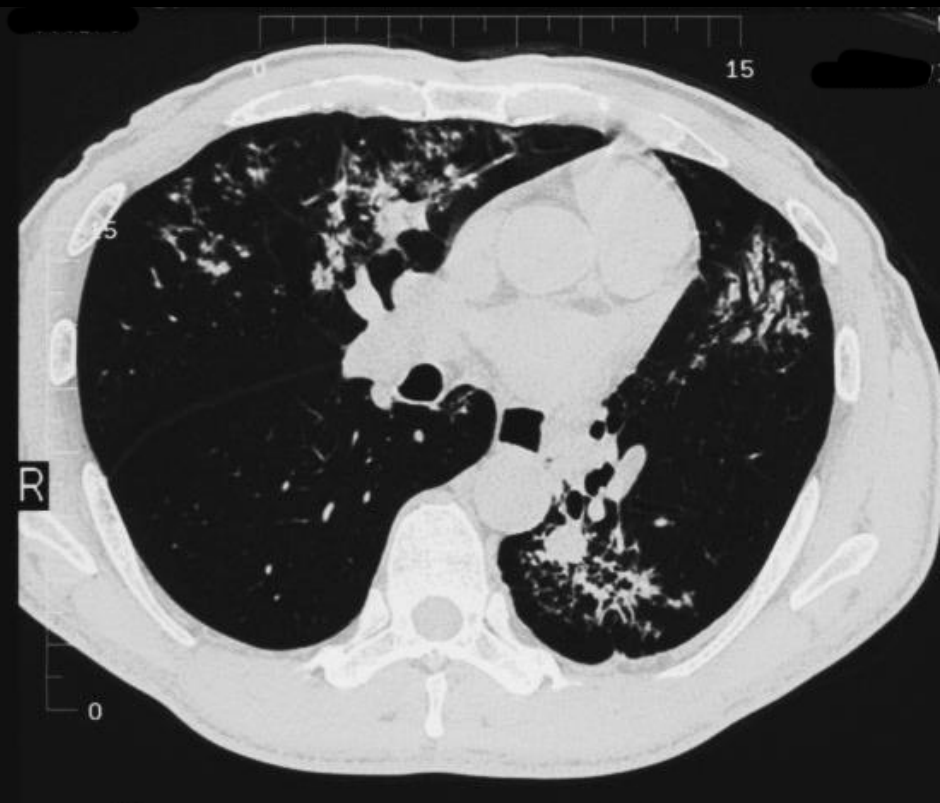
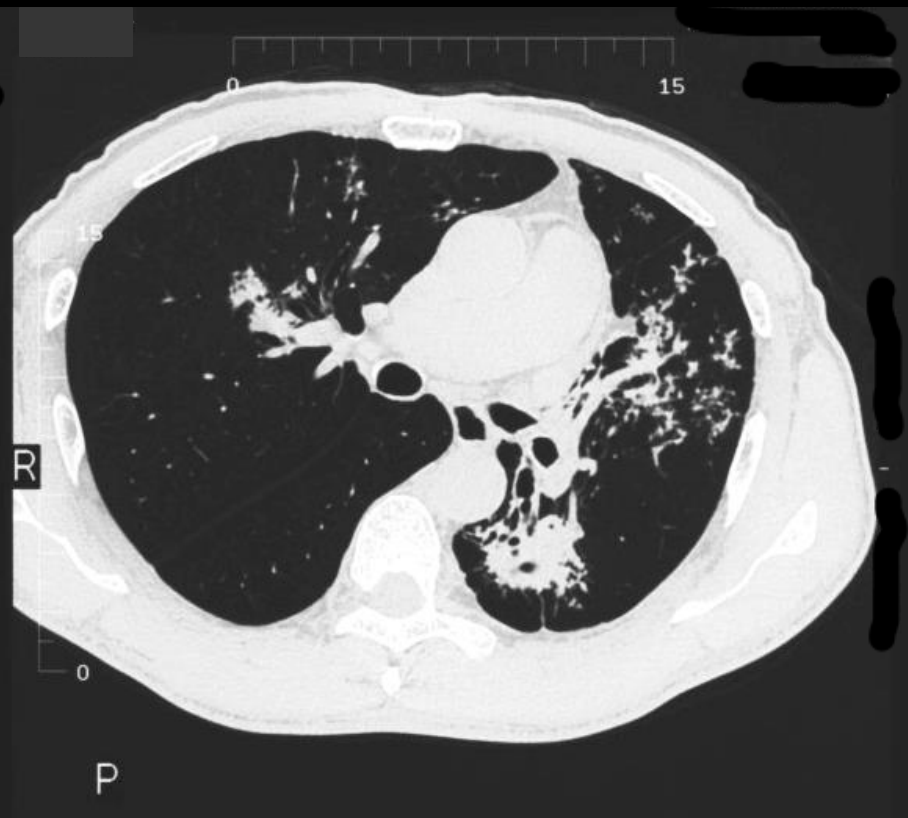
Baseline (1995)



Presentation

**Primary MD ordered chest CT
at local private hospital**

65 yo Korean Professor



Case Summary (II)

- Patient extremely resistant to work-up
- Sputum obtained his first visit to UHC:
AFB smear neg; culture → *M. tuberculosis*
Pan susceptible

Rest of the story:

Family appreciated my persistence

Completed RIPE DOT w/o further issues

Contact Investigation: No converters

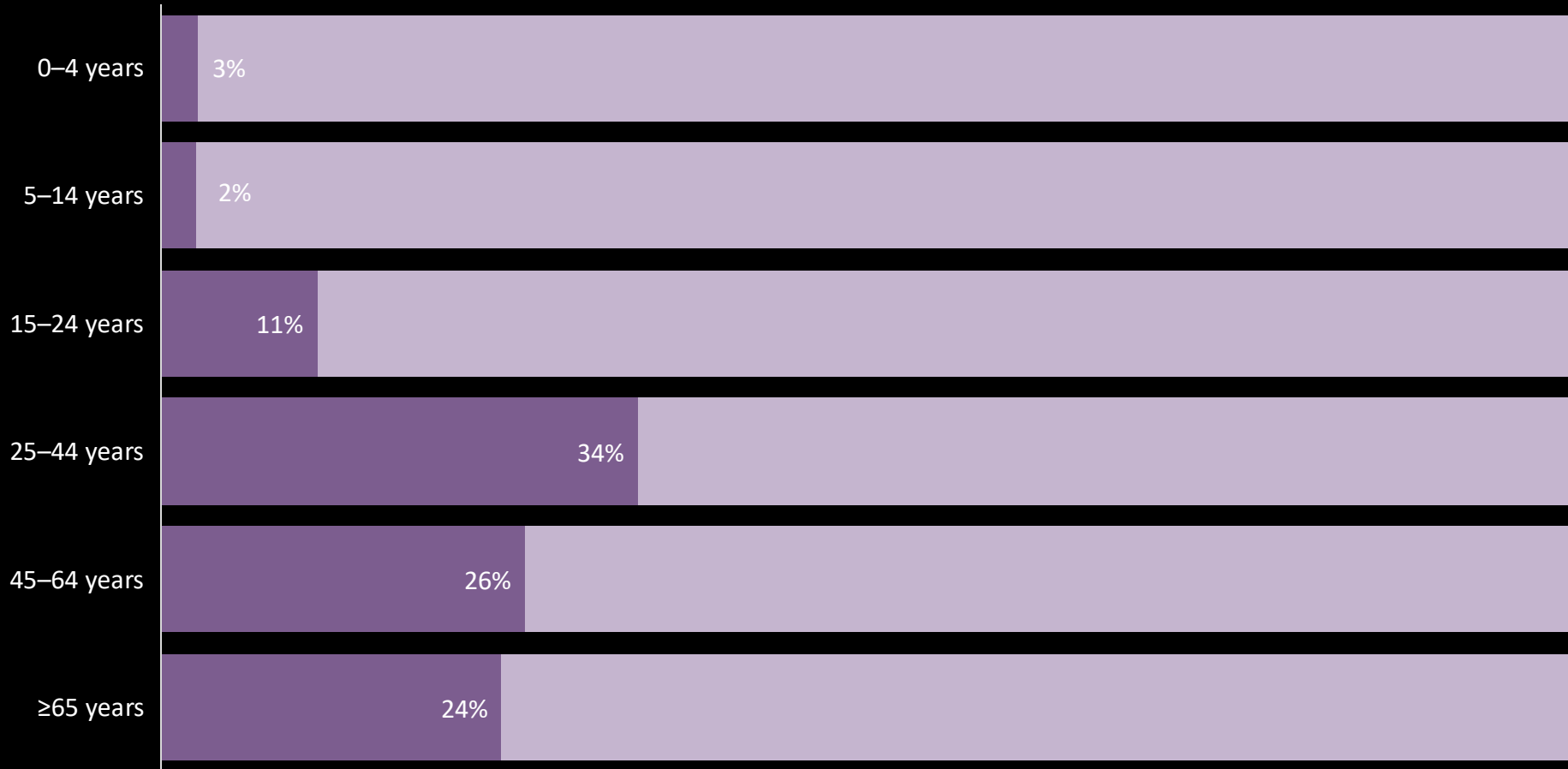
Case Summary Points

- US and foreign-born elderly reservoir for TB (latent infection)
- Elderly present atypically
- CXR “old TB scar” w/o calcification = higher risk for activation
- High index of suspicion required to detect active disease in elderly patients
- Treatment does not differ from younger non-immunocompromised population

TB in Elderly Patients

- No. people >60 increasing worldwide...By 2050 nearly 2x current numbers
- Most TB cases in elderly arise from inactive TB
- Larger reservoir of inactive TB infection
 - US born (grew up in era when TB more prevalent)
 - Under developed world (ie, immigrants to US, parents visiting adult children living/working in US)
- Those over 50 account for nearly 50% of US cases

%TB Cases by Age Group, US (N=10,388)



Age Related Factors Increase Likelihood

- Decline in immune system, *inflammaging* → Senescent T cell response
- Microbial barriers & clearance mechanisms decline
- Poor nutrition status common
- More coexisting diseases: COPD/ILD, DM, CKD
- More likely living w/in institutional setting
(TB rates higher nursing homes/chronic care facilities)

Elderly: TB Diagnosis More Challenging

- Less likely to present with classic symptoms of TB disease (ie, fever, night sweats, hemoptysis)
- Tuberculin Skin Test generally less reactive (2-step better)
- Nonspecific symptoms more common:
 - New cognitive impairment
 - Slow onset fatigue/weakness
 - Change in activities of daily living
 - Anorexia and weight loss
 - Persistent low-grade fevers
- Longer delay in diagnosis & duration of symptoms
 - Confused with other age-related diagnoses: Ca, DM, Malnutrition
- Initial TB diagnosis correct: 66% vs 94% younger grp
(Lung Cancer & pneumonia typical initial misdiagnosis)

Elderly: Additional Challenges

- Adverse drug effects more common
 - Liver damage
 - <35 y: 0.3%
 - >50 y: 2.3 - 4.1%
 - More severe & greater mortality
 - Others: Rash, Fever, GI upset
- Drug interactions
 - Mainly rifampin: coumadin, SSRI, opiates, etc
- Polypharmacy: identify “unnecessary” medications

Elderly: Determinants of TB infection/disease & Potential Solutions

TB Exposure

Biological, Social, & Health System determinants

- Remote infection by susceptible TB in low burden settings such as rural US
- Recent exposure in high-burden setting (resistance risk reflects community rate)
- Multi-generational household
- Congregate settings (ie, chronic care, nursing home)
- Use of public transport
- More frequent and/or prolonged contact with health care system
- Nosocomial TB transmission

TB Exposure

Possible Solutions

- TB surveillance focused on elderly groups; disaggregate data by age
- Knowledge raising campaigns via appropriate media or outreach, and possibly social services/family/friends
- Modelling to predict how best to respond to outbreak in elderly population (local/regional)

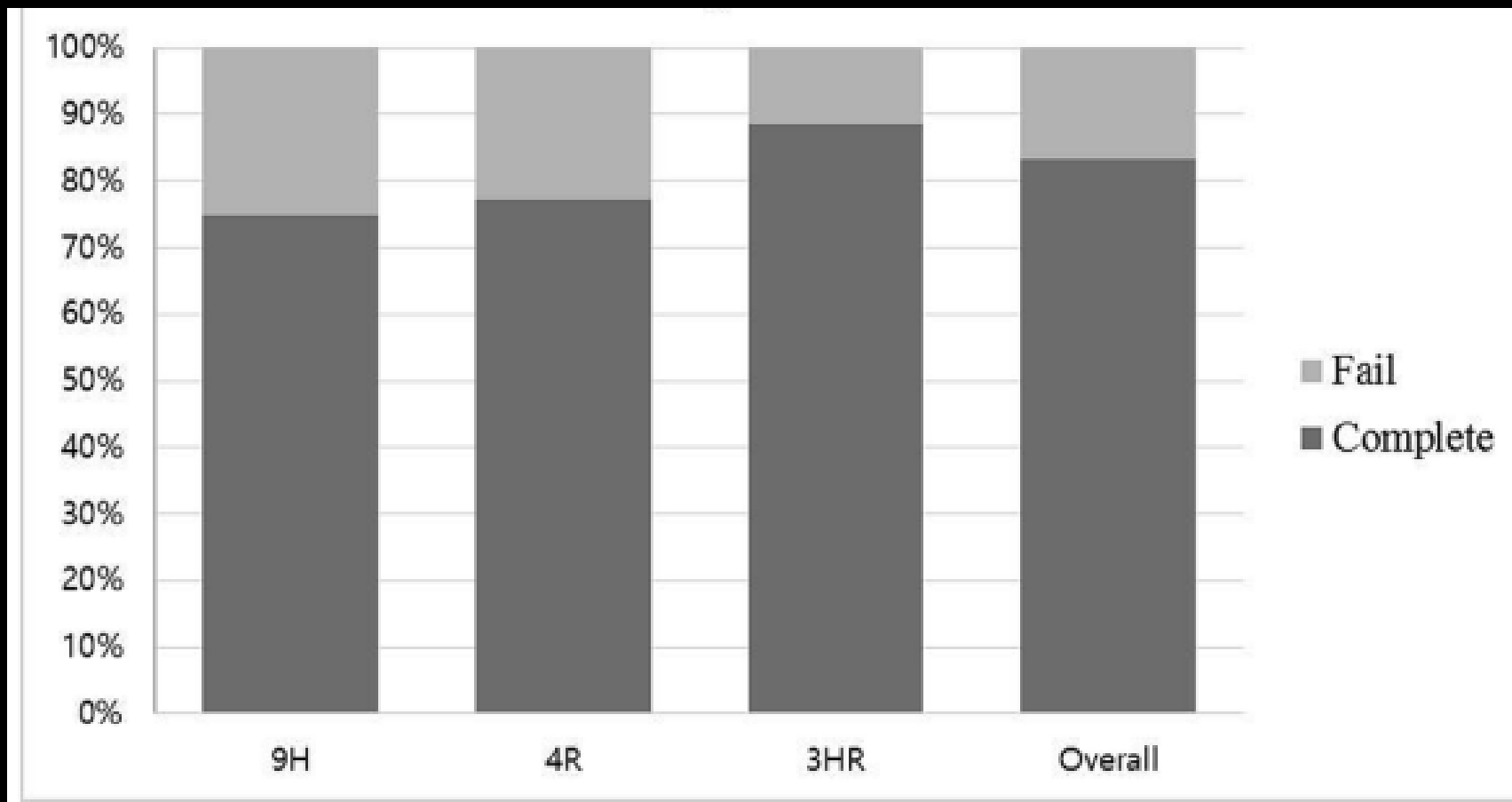
TB Infection: Screening/Prevention Rx

Biological, Social, & Health System determinants

- Immune senescence
- Malnutrition
- Comorbidities: COPD/ILD, CKD, DM
- TST less sensitive
- Reduced food intake (food insecurity)
- Reduced health knowledge
- Limited healthcare access
- Visual/Hearing impairment limits access
- Inadequate or no health insurance
- Inconsistent implementation of TB infection treatment

Elderly LTBI Rx Completion Rate

(Korea--Overall 83.1%, N=77)



9H = 9 months daily isoniazid

4R = 4 months daily rifampin

3HR = 3 months daily isoniazid & rifampin

TB Infection: Screening/Prevention Rx

Possible Solutions

- Implementation of IGRA screening (updated for elderly)
- Implement & utilize shorter prevention regimens, managing drug interactions/adverse effects
- Improve access to health insurance (simplified, adapted for hearing/visual impairment)

Everyone Stand Up!

- Put your L foot in...Put your L foot out...
- Put you L foot in & shake it all about...
- Do the Hokey Pokey
- Now turn yourself around...
- Put your R foot in...Put your R foot out..
- Put your R foot in & shake it all about...
- Do the Hokey Pokey
- Then turn your self around...

TB Disease: Screening/Diagnosis

Biological, Social, & Health System determinants

Similar to TB infection but add delayed diagnosis...

- Asymptomatic or pauci-symptomatic
- Atypical symptoms
- Less able to produce sputum
- X-ray w/o cavities, more often pleural disease
- Masking by concurrent disease: Lung CA, COPD/ILD
- Smoking/occupation lung disease
- Reduced food intake (food insecurity)
- Reduced health knowledge
- Inadequate access to social services/pension \$
- Limited health care access
- Visual/hearing impairment limits access
- Inadequate or no health insurance
- Lack or incomplete TB disease symptom screening

TB Disease: Screening/Diagnosis

Possible Solutions

- Large scale TB screening integrated with current health checks esp. those with co-morbidities
- Active case finding designed to reach underserved elderly
- Develop computer algorithms to identify TB among elderly (pauci-symptomatic)

TB Treatment: Outcomes, Sequelae

Biological, Social, & Health System determinants

- Adverse Drug Effects
- Drug-drug interactions (ie, rifampin)
- Polypharmacy
- Altered drug absorption, PK, & pharmacodynamics (eg, effect of ↓ muscle mass, GI disorders, etc)
- Pre-existing lung disease contributes to post-TB lung disease & disability
- Variable social support to facilitate adherence
- Memory, visual, and/or hearing impairments impacting adherence
- No consensus guidelines TB treatment in elderly
- Absent guidance for managing co-morbidities concurrently
- Inadequate or no health insurance

TB Treatment, Outcomes, Sequelae

Possible Solutions

- Improve social services, health care insurance, pension support
- More integrated care pathway for those w comorbidities
 - Geriatrics input (MD/Nurse)
 - Assess/manage frailty, disabilities (hearing, vision, etc)
- Enhance adherence
 - Considerations for memory, vision, hearing impairment
 - Use appropriate tools/media (ie, landline, setting alarms)