

# Protection of Health Care Workers

Occupational Health issues around  
TB Infection Control



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# Objectives for this session



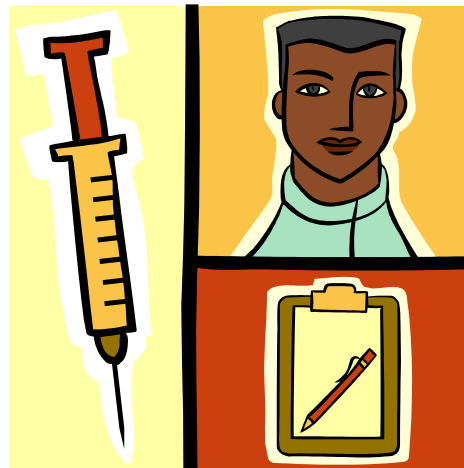
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# Occupational health

- Health care workers are a precious resource
- Their health must be protected
- On-site access to health care services should be provided
  - Free
  - Confidential



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# Risk of tuberculosis

- Health care workers are at an increased risk for TB infection and disease
- Includes **all staff** who have contact with persons with undiagnosed, untreated TB
  - Clinicians
  - Counselors
  - Peer educators
  - Other lay HCW's & volunteers
  - Cleaners and porters
  - Laboratory technicians



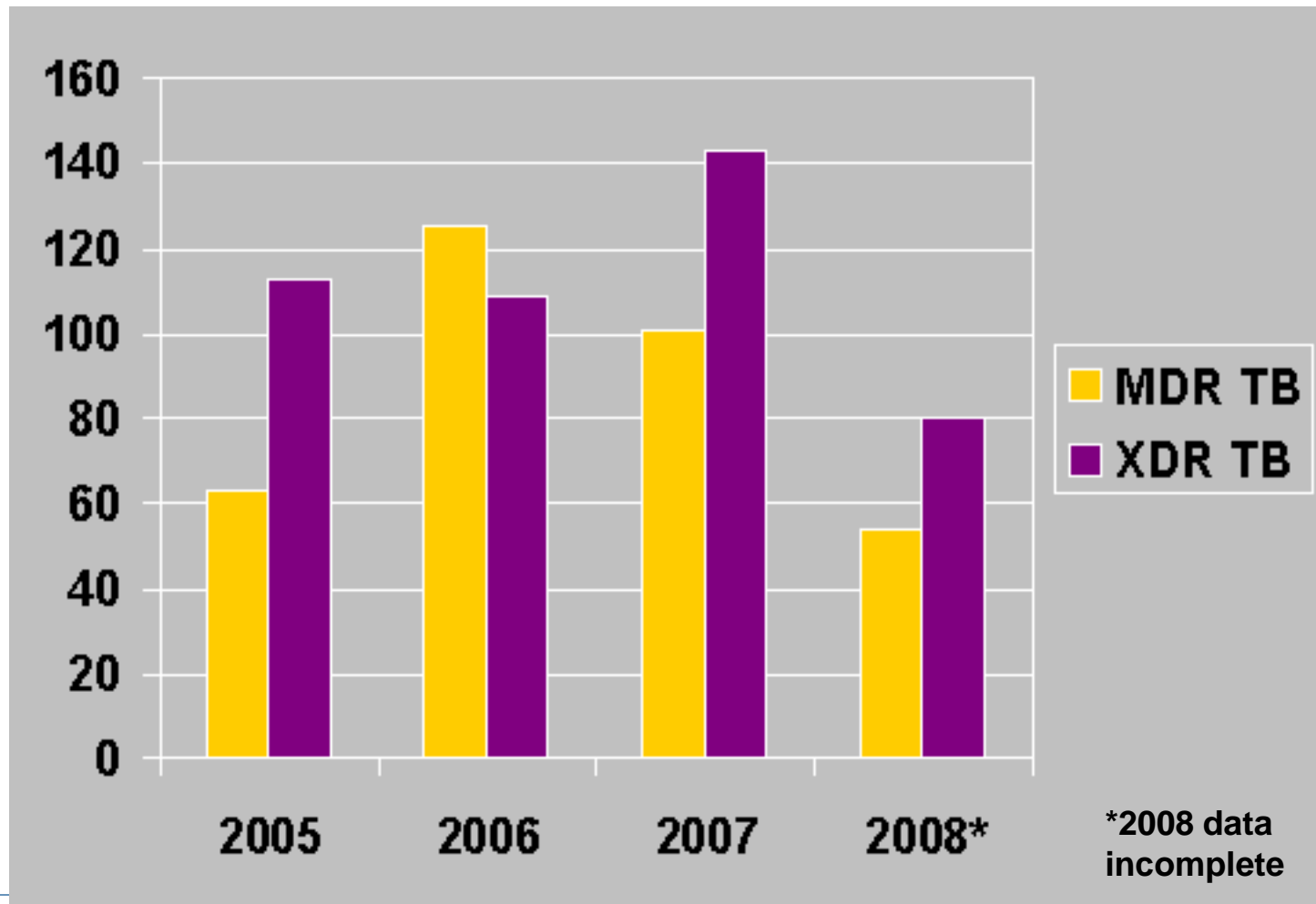
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# Case study: MDR/XDR at COSH (Tugela Ferry)

820 DR TB cases (57% XDR)



# COSH:

## Evidence for nosocomial transmission of TB

- 53 cases of XDR TB in 2005:
  - 85% of isolates had a similar genetic fingerprint by spoligotype: KZN strain
  - 55% had no prior TB treatment
  - 67% had been hospitalized in the last 2 years
- **Health Care Workers**
  - *13 HCW from COSH have documented MDR/XDR TB*
  - *9 have died (Since 2005)*
- Evidence for exogenous super-infection with new MDR/XDR TB strains while in hospital



# Risk of TB infection and disease in Health Care Workers

- In low-middle income countries:

	Data	Comments
<b>Prevalence of latent TB infection</b>	Medical/nursing students: 12% (CI 10-13) All HCWs: 54% (CI 75-82)	Working in medical wards, doing sputum induction, contact with TB pts: independent occupational risk factors
<b>Annual Risk of TB infection</b>	Range 2.6-11.3%	Risk attributable to occupational exposure
<b>Incidence of TB disease</b>	HCW 2-3x higher risk of morbidity than expected	Risk highest for HCWs in TB wards, laboratories, general medical wards and emergency rooms
<b>Effectiveness of TBIC measures</b>	Limited available evidence suggests that reduction in TB infection risk is possible with simple administrative controls	Larger, controlled trials needed



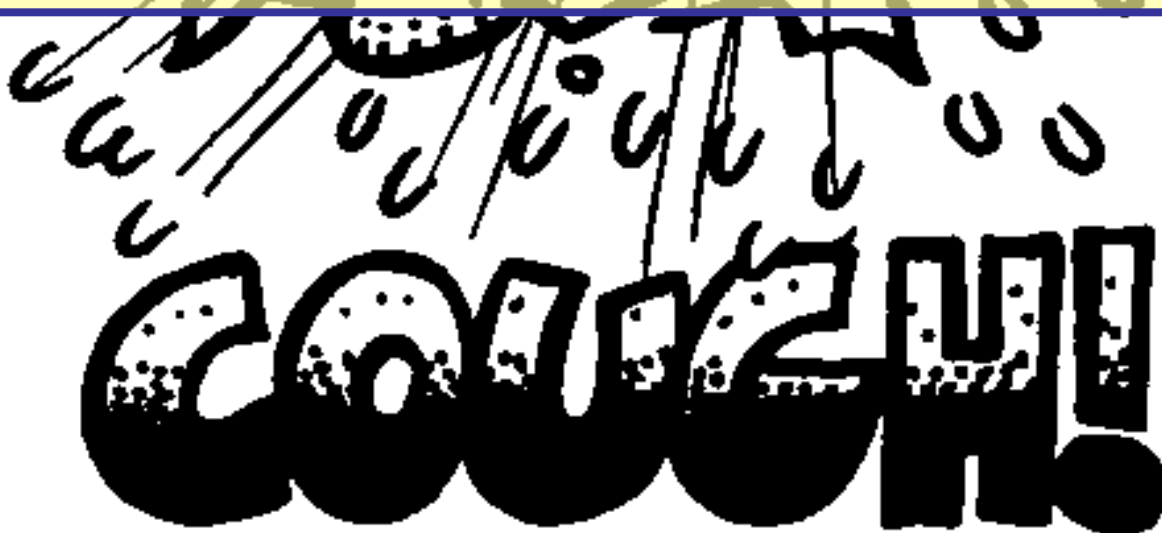
# Risk Factors for Nosocomial TB Infection in Health Care Workers

- Work involves diagnosis and treatment of TB patients
- Frequent and direct patient contact
- Longer duration of patient contact
- Longer duration of employment
- Frequent contact with TB patients who have not been placed on treatment or with undiagnosed drug resistance
- Work involves cough-inducing procedures
- Work in environments with limited or no infection control procedures in place
- HIV-infected





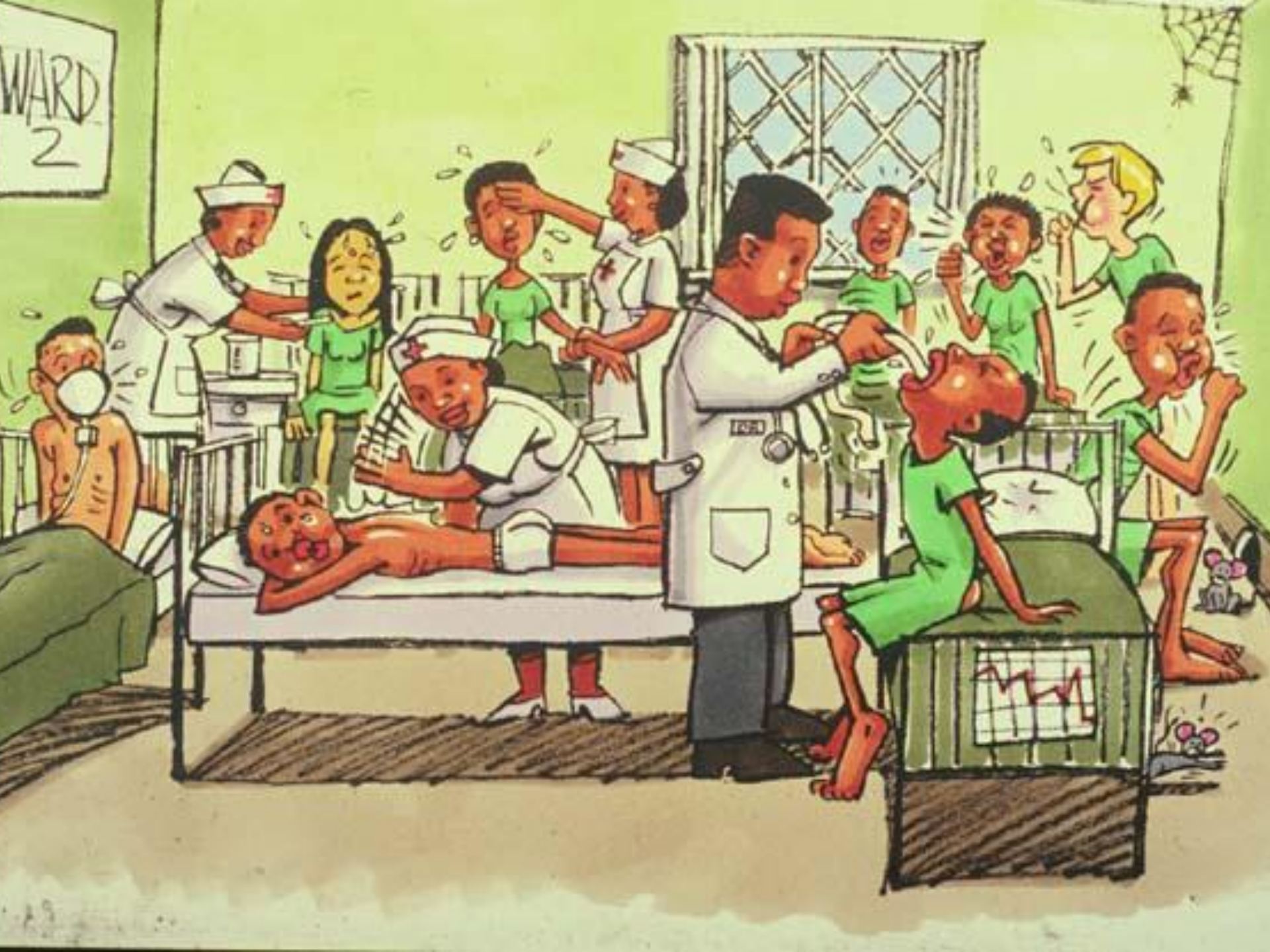
**Undiagnosed and untreated  
TB patients pose the greatest  
threat to health care workers**



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# Managerial TBIC measures

## Work-practice & Administrative TB Infection Control measures

## Environmental TB Infection Control measures

## Protection of HCW's and staff

TB/HIV integration  
Cough screening  
Cough etiquette  
Patient education  
Staff training  
Quality Assurance & Admin support  
Initiation of Rx  
Prompt Dx  
Separation  
Fast-tracking

Natural ventilation  
Mechanical ventilation  
UV germicidal irradiation  
Filtration

Staff HIV VCT  
Personal respiratory protection  
Staff awareness on TB

TBIC coordinating committee

TBIC facility policy/plan



# Measures to Reduce Risk of TB Transmission to Health Care Workers

- Implementation of TBIC plan (administrative & environmental measures):
  - Reduce exposure time to TB
  - Improve ventilation
- Risk to staff will not be reduced to zero
- Additional staff protection needed:

- ✓ Recognition of signs and symptoms of TB disease
- ✓ Prompt care-seeking if symptomatic
- ✓ Standard treatment of staff with active TB
- ✓ Access to Voluntary Counselling and Testing (VCT)
- ✓ Priority access to HIV care and treatment
- ✓ Option of reassignment for HIV-infected HCWs



# Screening of HCWs

## To detect TB disease early

- Annual screening?
  - Screening for infection (TST conversion) not shown to be effective in high prevalence areas (SA)
  - Symptom screening useful
- Regular reminders on possibility of developing TB
  - During (annual) TBIC in-service/refresher training
- Policy on HCW services and training should form part of TB infection control plan
  - Address all professional and non-professional staff categories
- Services should be:
  - Free of charge
  - Confidential
    - Special staff health clinic
    - Health care practitioners from outside facility contracted to consult staff members



# Management of HCW who are symptomatic for TB

- Staff to be investigated for TB if symptomatic
  - Sputum investigation if cough > 2 weeks
  - Chest x-ray
  - Other investigations as indicated
- Special consideration for employees with increased individual risk
  - HIV positive (peers!), previous TB, diabetes, cancer, on steroids, smoking, silica exposure, suspected M/XDR
- HCW who develop TB must not work while infectious
  - Majority of TB patient (drug sensitive) convert after 2-3 weeks on Rx



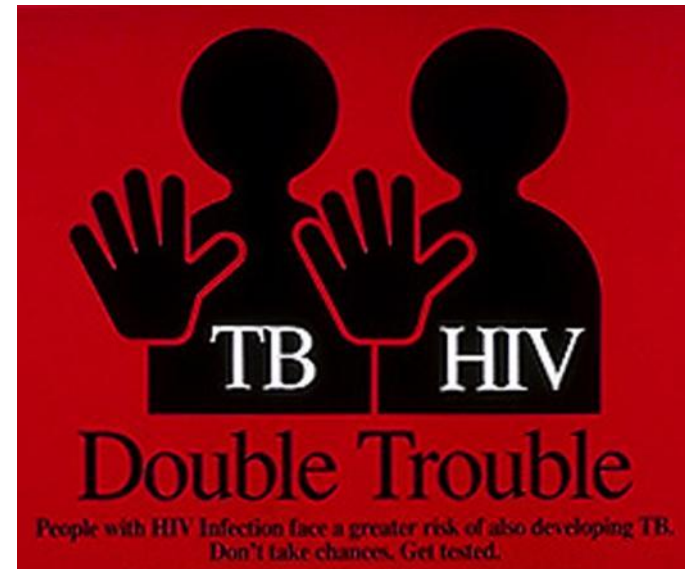
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# Knowledge of HIV status

- Risk of TB greater if HCW is HIV-infected
- All HCWs should know their HIV status
- Access to voluntary counseling & testing should be available for HCWs
- Periodic retesting
- HCW confidentiality must be assured
- Efforts must be made to reduce stigma



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# Increasing access to VCT for HCWs

- Use of rapid test kits at home
- Travel to another setting where test truly confidential
- *Bringing in mobile counseling team from another community*
- **No role for mandatory testing of HCWs**



*the* **Risk** is **NOT**  
knowing.  
Get **tested.**



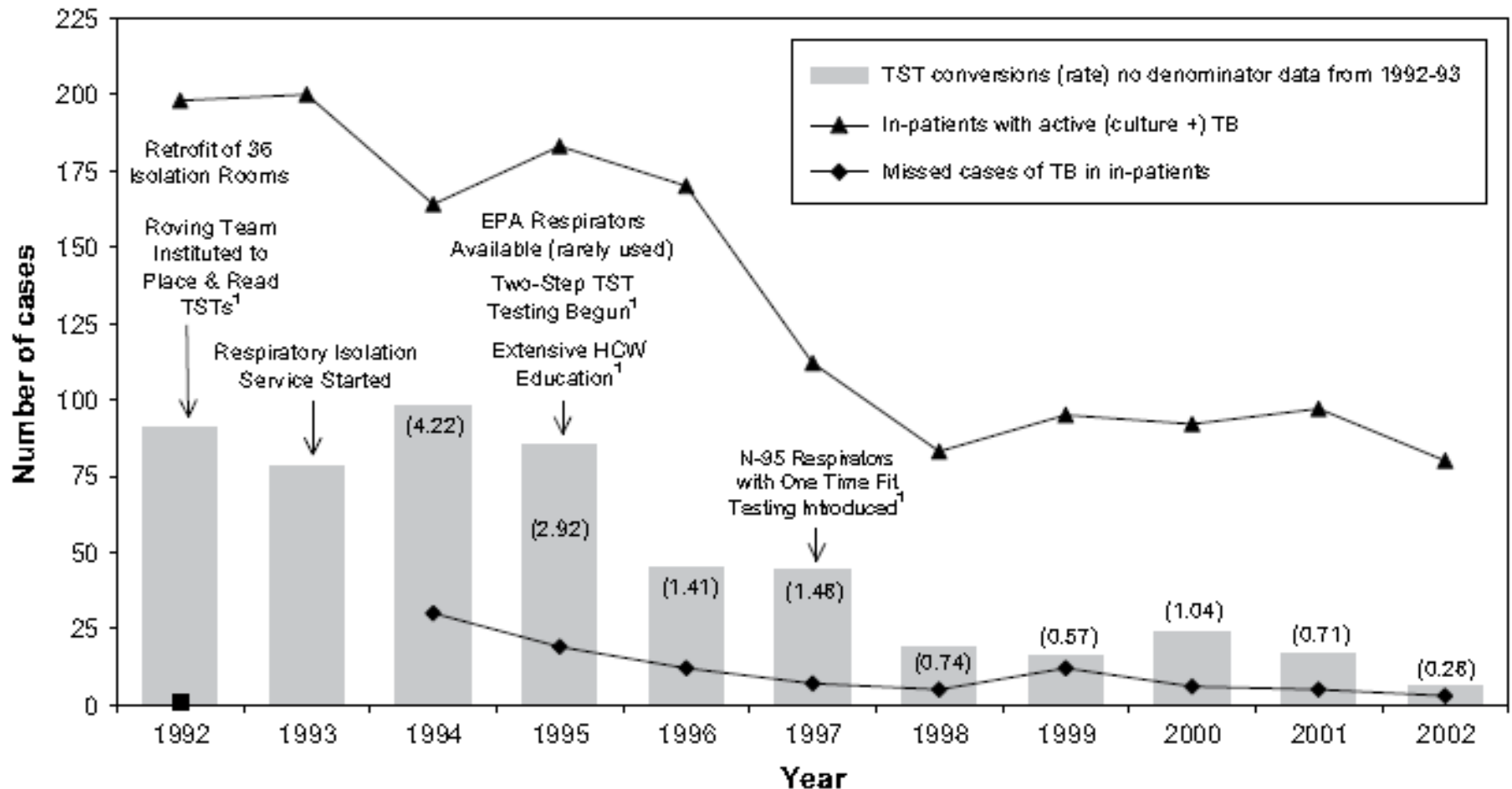
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# Example from the developed world

**Trends in Tuberculosis Cases and Health Care Worker Tuberculin Skin Test Conversions and Major Infection Control Interventions**



# Is this relevant to our setting?

TBIC measure implemented	Relevance
TST policy adherence	TST screening not relevant in high prevalence areas (WHO and SA infection control guidelines)
Isolation policies	Relevant for in-patient settings (general, TB and DR TB). Separation relevant for out-patient settings.
HCW education	Important aspect of TBIC plan
Engineering controls	Relevant, feasibility depending on availability of funds
Respiratory protection	Relevant, specifically in high-risk situations



# Back to the SA case study: COSH

## TBIC program: personnel protection

July-Sept 2007	Staff surveys conducted
Aug 2007-ongoing	TB Education sessions
2007-ongoing	Regular staff screenings by Occupational Health
Oct 2007	N95 mask use policy Fit testing and staff education regarding fit checks
2007-ongoing	VCT promotion amongst staff and inpatients with provision of ARV's HCW option of discreet transfer to lower risk area of hospital



# Staff health campaigns at COSH

TB screening and VCT uptake among staff:

	TB Screen	TB Rx N (%)	VCT	HIV Pos N(%)
2007	119	6 (5)	37	3 (8)
2008	153	17 (11)	74	10 (14)



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# Services for HIV-infected HCW

- Access to HIV care and treatment (ARV's, OI prophylaxis)
- Opportunity to work in areas with lower risk of exposure to TB
- Isoniazid Preventive Therapy (IPT)
  - SA National guidelines currently under review
    - TST/Eligibility criteria
  - Studies of HIV infected patients showed that IPT for 6 months prevented TB for up to 2 years

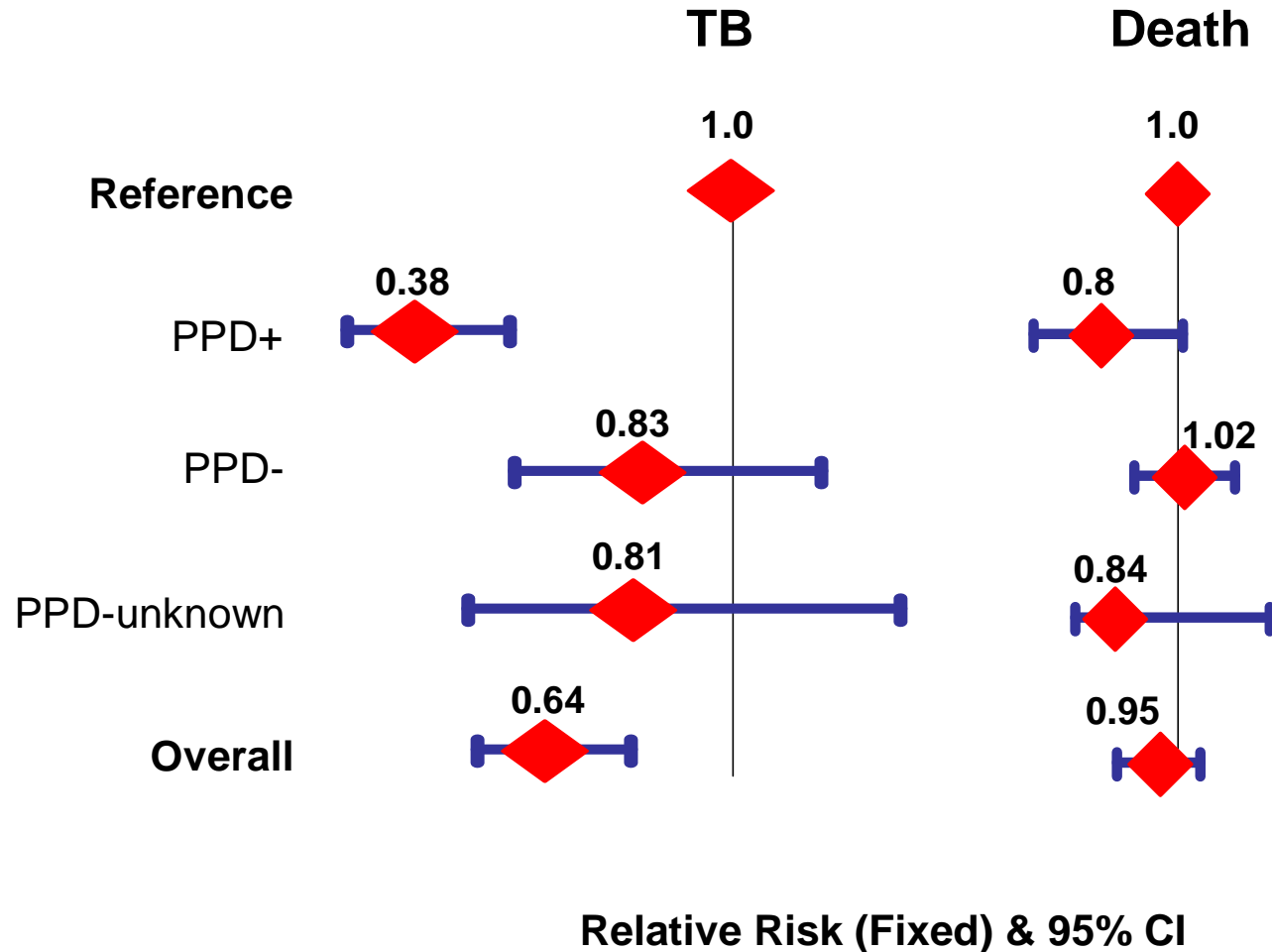


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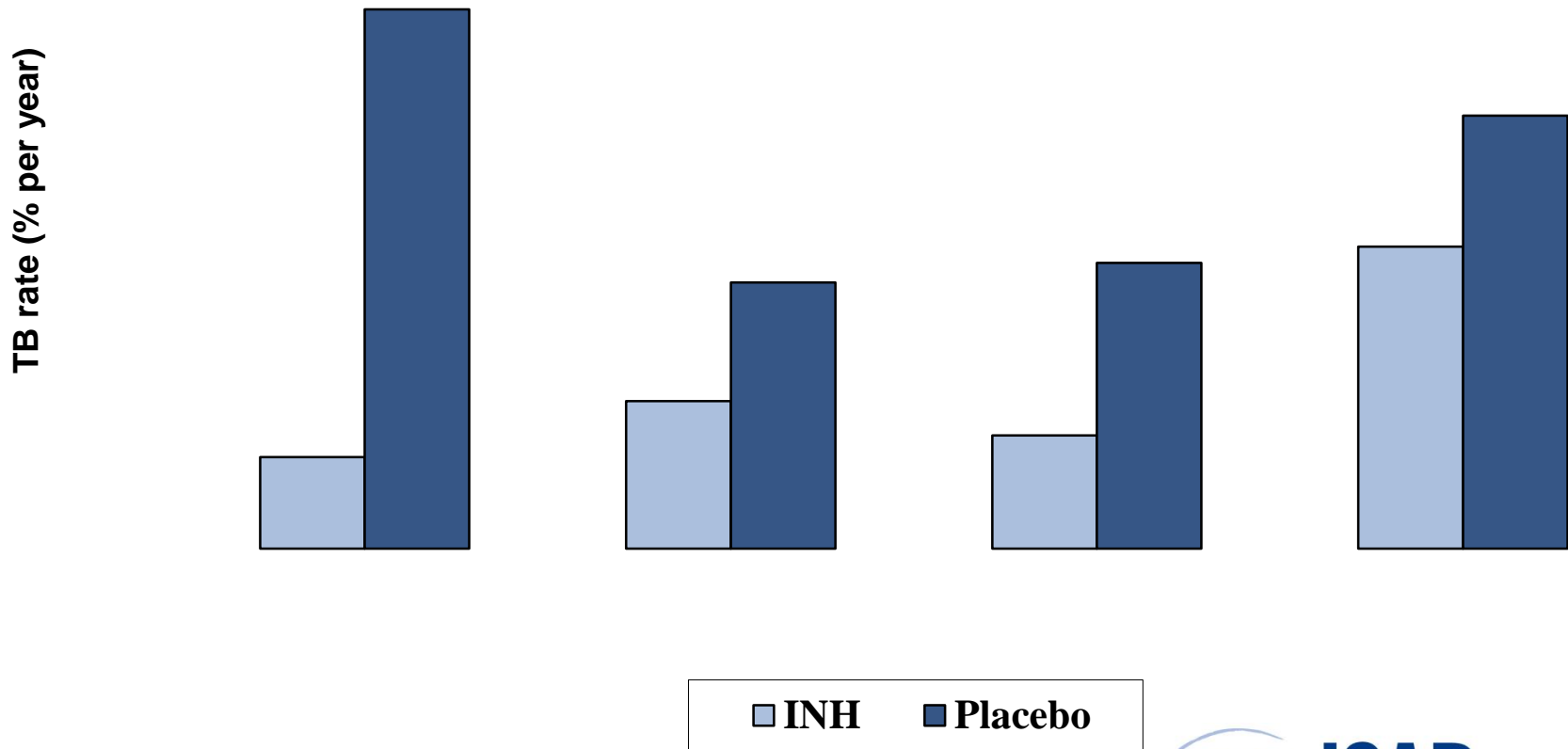
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# Efficacy of TB preventive therapy among HIV-infected individuals



- 10 PCT
- N=8130
- Uganda, Kenya, Zambia, Haiti, Brazil, Mexico, Spain, USA

# Efficacy of INH Preventive Therapy in HIV-positive, TST-positive ( $\geq 5\text{mm}$ )



Isoniazid (INH) reduces active TB rate by 60%  
(among tuberculin skin test (TST)-positive persons)



# Safety of INH Preventive Therapy

- Transient rise in transaminases (AST/ALT) common
- Hepatotoxicity is a serious side effect
- Death can occur if INH not discontinued
- With monitoring and education, risks of hepatitis and death small (0.001%-0.004%)
- Risk increased with older age, alcohol use, chronic hepatitis B



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# Personal Respiratory Protection

## N95 respirators

- Third line of defense
  - **Ineffective in absence of administrative and environmental control measures!**
- Relatively expensive to purchase
- Proper fit important for effectiveness
- Staff needs training:
  - On how to use the mask
  - How long to (re)use it for
  - Seal checks



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# High-risk situations where N95 is needed

- Isolation rooms for patients with TB, especially M(X)DR-TB
- Sputum induction or other cough-inducing procedures
- Bronchoscopy suites
- Autopsy areas
- Spirometry rooms
- Surgery on potentially infectious TB patients



***In conjunction with administrative and environmental control measures***



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# Personal protective equipment

## Respirators versus masks



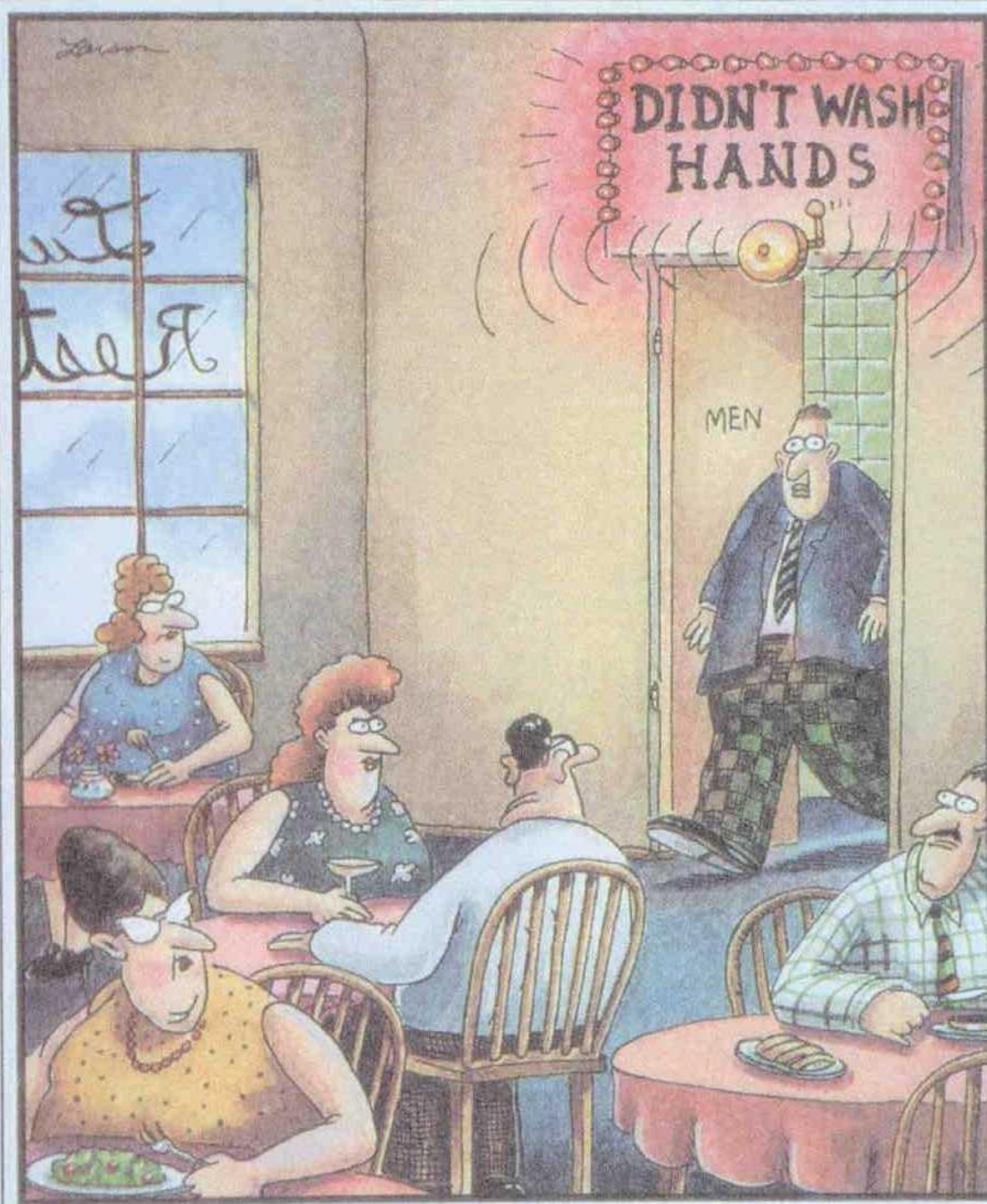
### RESPIRATOR

- Tiny pores
- Relies on air-tight seal around the entire edge



### SURGICAL MASK

- Large pores
- Lacks air-tight seal around edges



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# Conclusions

- Important to take care of HCW's as a scarce resource
- Comprehensive approach to TBIC needed
  - Combining administrative, environmental and HCW protection measures
- Staff awareness of TB transmission, TB signs/symptoms, staff VCT and personal respiratory protection should be addressed in facility TBIC plan
- Take special care of HIV-positive HCW's

