

## Risk for Tuberculosis in Swiss Hospitals

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## Content

1. Who is at risk
2. Factors that influence the risk for TB
  1. Health care worker characteristics
  2. Patient characteristics
3. Situation in Switzerland compared with other countries

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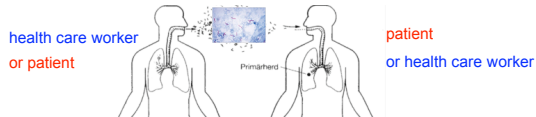
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## Introduction



- Pulmonary or laryngeal Tbc
- Cough, sneeze, shout, sing
- Concentration of infectious droplets
- Duration of exposure
- Close contacts

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Risk for Tuberculosis in Swiss Hospitals 

**Introduction** **STATE OF THE ART**

**Risk of tuberculosis infection and disease associated with work in health care settings**

|                  | Low-Middle Income Countries | High Income Countries |
|------------------|-----------------------------|-----------------------|
| prevalence       | 63% (33-79%)                | 24% (4-46%)           |
| annual incidence | 5.8% (0-11%)                | 1.1% (0.2-12%)        |

Menzies D, Int J Tuberc Lung Dis 2007;11:593-605  
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Risk for Tuberculosis in Swiss Hospitals 

**Who is at risk?**

- Administrators or managers
- Bronchoscopy staff
- Chaplains
- Clerical staff
- Computer programmers
- Construction staff
- Correctional officers
- Craft or repair staff
- Dental staff
- Dietician or dietary staff
- ED staff
- Engineers
- Food service staff
- Health aides
- Health and safety staff
- Housekeeping or custodial staff
- Homeless shelter staff
- Infection-control staff
- ICU staff
- Janitorial staff
- Laboratory staff
- Maintenance staff
- Morgue staff
- Nurses
- Outreach staff
- Pathology laboratory staff
- Patient transport staff, including EMS
- Pediatric staff

Centers for Disease Control and Prevention  
2005. MMWR 2005;54  
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Risk for Tuberculosis in Swiss Hospitals 

**Who is at risk?**

- Pharmacists
- Phlebotomists
- Physical and occupational therapists
- Physicians
- Public health educators or teachers
- Public safety staff
- Radiology staff
- Respiratory therapists
- Scientists
- Social workers
- Students
- Technicians
- Veterinarians
- Volunteers
- Persons:
  - entering patient rooms or treatment rooms whether or not a patient is present
  - participating in aerosol-generating or aerosol-producing procedures (e.g., bronchoscopy, sputum induction, and administration of aerosolized medications)
  - participating in suspected or confirmed *M. tuberculosis* specimen processing; or installing, maintaining, or replacing environmental controls in areas in which persons with TB disease are encountered

Centers for Disease Control and Prevention  
2005. MMWR 2005;54  
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### Health care worker related factors that influence the risk for TB

**General:**

- prevalence of TB
- patient population
- effectiveness of TB infection-control

**Aerosol generating procedures:**

- bronchoscopy
- endotracheal intubation
- suctioning
- autopsy
- sputum induction
- inhalation therapy

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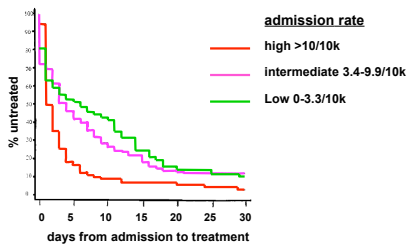
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### Delay in Tbc Diagnosis



Am J Respir Crit Care Med 2002;165:927-933

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### Patient characteristics for increased infectiousness

- presence of cough
- cavitation
- Positive AFB sputum
- Involment of the larynx
- Failure to cover mouth and nose when coughing
- incorrect, lack of, or short duration of treatment

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Risk for Tuberculosis in Swiss Hospitals 

### Risk for TB in Swiss Health care workers

3 Studies

|          |      |
|----------|------|
| Rudaz L  | 1996 |
| Schoch O | 1999 |
| Turk A   | 2003 |

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Risk for Tuberculosis in Swiss Hospitals 

### TST Conversion in out-patient vs. in-patient HCW

TST conversion rate:

|             |                |
|-------------|----------------|
| out-patient | 13/200 (6.5%)  |
| in-patient  | 61/4650 (1.3%) |

annual risk of infection:

|             |            |
|-------------|------------|
| out-patient | 1.3-2.8%   |
| in-patient  | 0.26-0.35% |

Latent Tbc Infection Therapy:

|             |      |
|-------------|------|
| out-patient | 1.9% |
| in-patient  | 0.3% |

Rudaz-Béguin L: Tubercle Lung Dis 1996;77:109

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Risk for Tuberculosis in Swiss Hospitals 

### TST Testing in HCW: big workload with little impact

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1241 starting employment
↓
261 HCW contact with TB
↓
180 (69%) follow-up TST
↓
37 TST increase
↓
17 true TST conversion
↓
5 complete preventive Therapy

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Schoch O: Schweiz Med Wochenschr 1999;129:217

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### TST Testing in HCW: big workload with little impact

547 working hours to prevent 1/2 TB Infection

4/9 nosocomial active TB cases

None of them diagnosed through TST surveillance

Schoch O: Schweiz Med Wochenschr 1999;129:217

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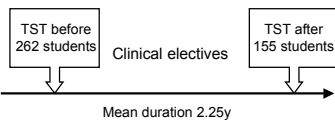
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### TB infection in Swiss medical students during clinical electives



Turk A: Int J Infect Dis 2003;7:268

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### TB infection in Swiss medical students during clinical electives

12/155 (7.7%) TST conversion

Conversion rate of 3.4% per year

Possible bias

BCG vaccination (83.9%)

Booster effect

Selection bias

Turk A: Int J Infect Dis 2003;7:268

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### Prevalence of LTBI among HCW in Denmark TST vs. INF- $\gamma$ whole blood tests

2 centers in Copenhagen

139 volunteer HCW, 106 BCG vaccination

34% positive TST (47/139)

1% positive QuantiFERON TB-Gold test (2/139)

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### Prevalence of LTBI in HCW in Geriatric Care in Germany

3 centers, 454 HCW, QFT-IT

Prevalence in

|                |       |
|----------------|-------|
| Geriatric care | 19%,  |
| Other HCW      | 10.5% |

Odds ratio 2.4 for geriatric care units

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### Prevalence of LTBI in HCW in Geriatric Care in Germany

| <u>Age</u> | <u>LTBI prevalence</u> |
|------------|------------------------|
|------------|------------------------|

|     |      |
|-----|------|
| <30 | 4.6% |
|-----|------|

|     |       |
|-----|-------|
| >60 | 69.2% |
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## Conclusion

- HCW are at higher risk for LTBI
- Early recognition of possible TB cases is important
- Effective TB infection-control is crucial
- Estimated annual risk for swiss HCW is around 1%
- HCW characteristics (foreign born, immunosuppression) are becoming important
- INH Therapy is rarely completed

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