# Laboratory

- Often a bottleneck or a factor to define the velocity of the survey

# Lab work

Smear Microscopy

Direct Smear, ZN

LED-FL

Collect, Store, Transport and
Put in Culture within 5 days

# Sputum collection

- At least two samples: so far- spot+morning
- STAG-WHO recommendations
  - Two spots with 1hr or longer interval
- Difficult to collect quality specimen from non-symptomatic

- No-induced sputum, no laryngeal swab, no gastric tubing

# Reverse cold chain from collection to processing the specimen

- 3 days from collection and local storage to a culture lab
- 2 days in culture lab till processing

Do within 5 days, maximum in 7 days

# Estimate workload

- Sample size: 50,000
- 90% participation: 45,000
- 12% eligible for sputum exams: 5,400
- 95% of specimens are collected and arrived: 10,500 samples
- If ZN MS: 420 person days, If LED FL MS: 105 person days
- Capacity of culture: Human resources, incubators etc

# Smear

- Work Load: ZN 25, LED FL 100/ Per technician day
- Qualified by the EQA by lot sampling does not mean a capacity for study at all
- Smear in local lab may increase a chance of contamination – Open and re-cap
-

# Exam in repeated surveys

- Is it really necessary to keep consistency in exam methods?
  - Which has priority: Having more accurate estimate or simply comparing two survey results?
  - HIV TB: lower bacteriological load - Prevalence of TB detectable by conventional technology may decrease while that of TB with lower bacteriological load in sputum increases

# Quality of Sputum samples

- Directly Observed Taking Sputum at least for Spot Specimens
  - Clear Instruction, Visual Aid (posters)

- Don't discard "saliva" specimens
  - Judgement by naked eyes are not always correct

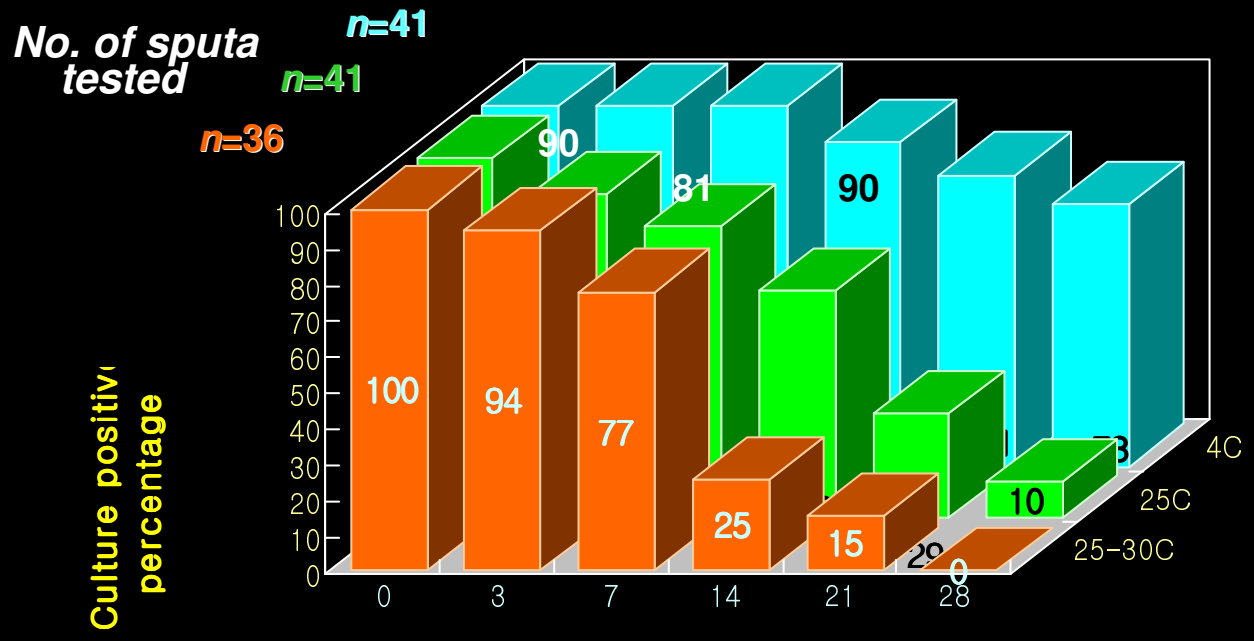
- One specific specimen: Smear and culture in same lab → "Smear - re-cap – transportation" causes contamination

# Quality Assured Lab often failed

- Survey specimens from field are totally different from clinical specimen from TB suspects in medical facility
  - Quality of sputum
  - Volume of a single specimen
  - Bacteriological load
  - Time(days) from collection to examination
  - Quantity (No. of specimens sent one time)

➔ Limit the number of Labs and technicians to assure quality examinations

# VIABILITY CHANGE OF *M. TUBERCULOSIS* IN SPUTUMS STORED AT DIFFERENT TEMPERATURES



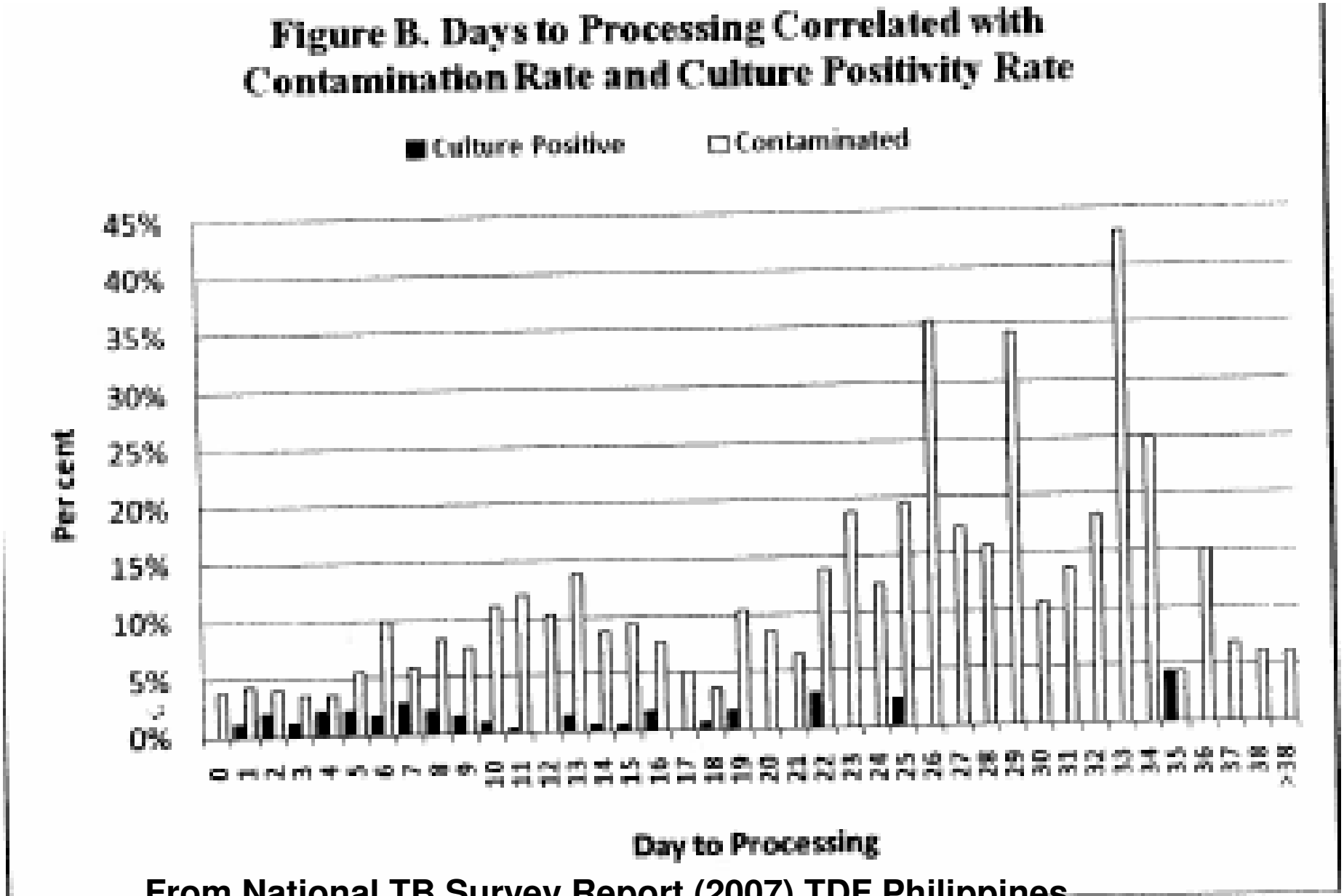

*Kim SJ, et al, 1986*
*Paramasivan CN, et al, 1983*

# One culture or two or more

| number (cases) | | 1st sputum | | total |
|---|---|---|---|---|
| | | any positive | negative | |
| 2nd sputum | any positive | 151 | 74 | 225 |
| | negative | 61 | | |
| total | | 212 | | 284 (all positive cases) |

At least one: Having additional exam has more yield than expanding the screening criteria

**“1/3 of specimen could not be treated within 7 days after collection”**




**From National TB Survey Report (2007) TDF Philippines**

# Unexpected Problem in a certificated Lab at the beginning

## We may have more S(-)C(+) cases

**Experiences in National TB Lab in Yangon, 2006**

| Culture Recovery Rate of S(+) Cases | | | | | | |
|---|---|---|---|---|---|---|
| | Any positive | | | Smear (+) Cases | | |
| | number | C(+) | (%) | number | C(+) | (%) |
| First 16 clusters | 50 | 23 | 46% | 37 | 23 | 62% |
| Second 14 cluste | 25 | 21 | 84% | 23 | 21 | 91% |

(Non-eligible participants are included)

Technical problem in sputum treating process (ex.decontamination) was suspected

- Philippines
- Myanmar
- Cambodia
- Ethiopia

# WHO recommended method
# or
# Locally adapted method

Concentration method

Or

Direct method

"quality of exam affect more than difference by methods does"