Diagnostic accuracy of chest X-rays acquired using a digital camera for low-cost teleradiology

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Problem

A

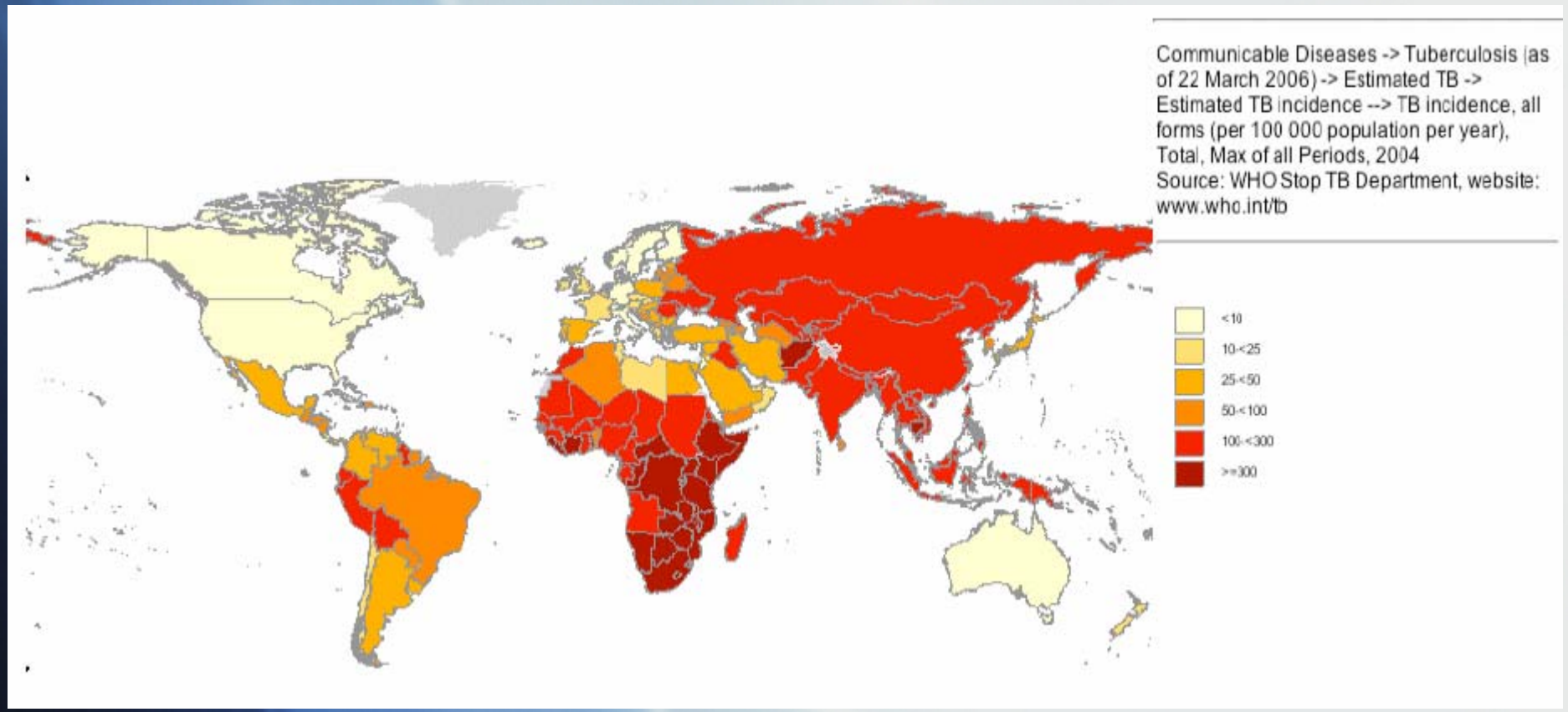
B

Two chest x-ray images removed due to copyright restrictions.

Source: emedicinehealth.com

Source: studentBMJ 2000;08:303-346

Incidence of TB



Courtesy of the World Health Organization. Used with permission.

Prevalence of Physicians

Country	Doctors/100,000 people
US	279
South Africa	56.3
Peru	93.2
Haiti	13

14 countries in Africa have 0 radiologists

Solution

- Store-and-Forward Telemedicine

- Take digital photo of Chest X-ray
- Edit
- Compress file
- Email photo with text to physician
- Wait for DX

Research

- What is the most compressed image format that can be used that still allows for reliable diagnosis of TB?

- Compared DX of

  Original image

  JPEG ~ 400 KB

  JPEG2000 ~ 98-120 KB

Results

- JPEG and JPEG2000 images were diagnosed similarly to the original images.

- Overexposure in the digital processing actually increased detection of calcifications

Highlights of Paper

- Good understanding of medical imaging
  - Gray-Scale
  - Window and Level
  - Exposure
- Good understanding of TB DX
- Study did not use top-end cameras

Questions

How do you think results would change if study had been performed in the field and not Boston?

What context does your own project take place in and how can you use that to your advantage?

MAS.965 / 6.976 / EC.S06 NextLab I: Designing Mobile Technologies for the Next Billion Users
Fall 2008