

Personal microbiology laboratory strengthening experiences in Asia

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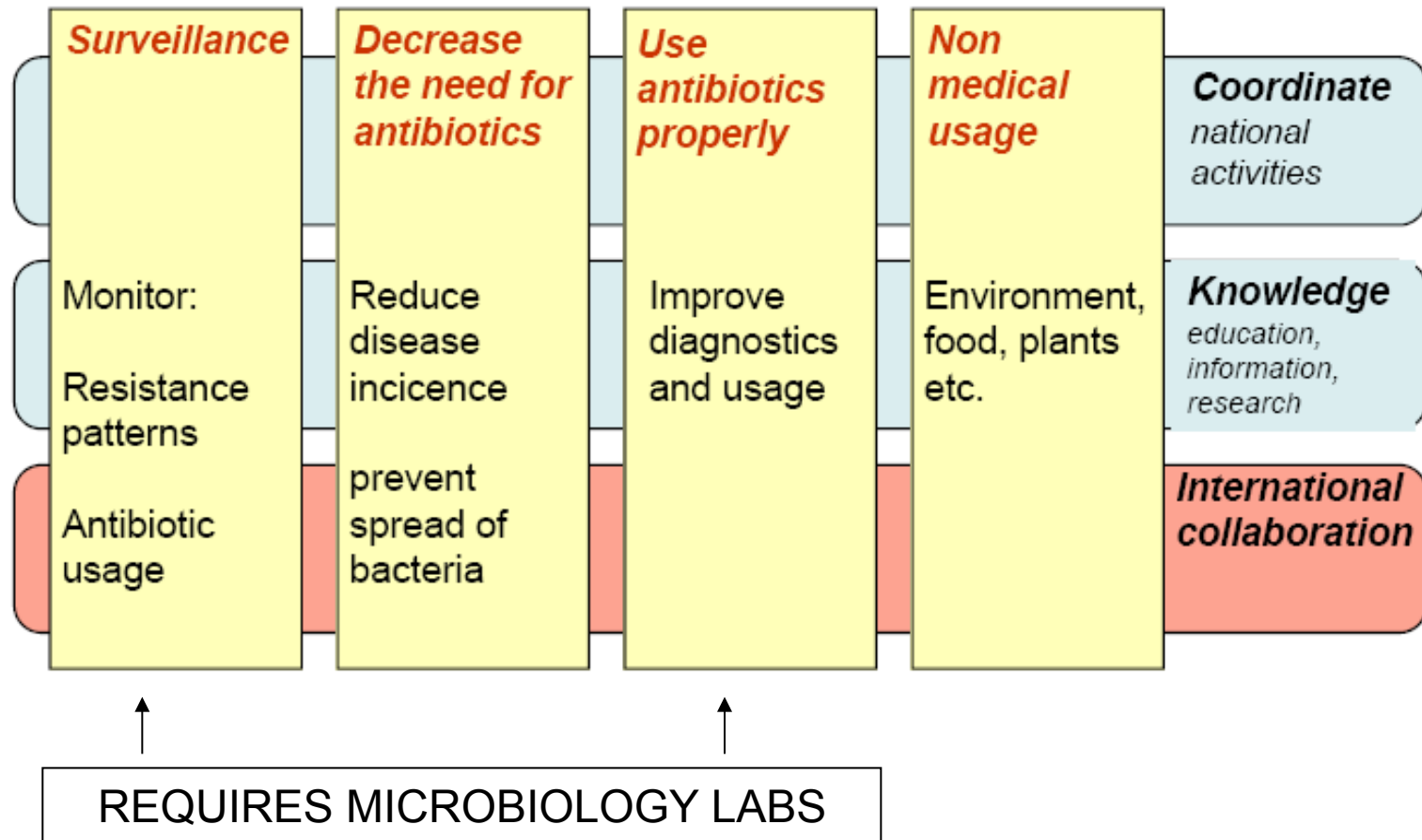
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Addressing resistance

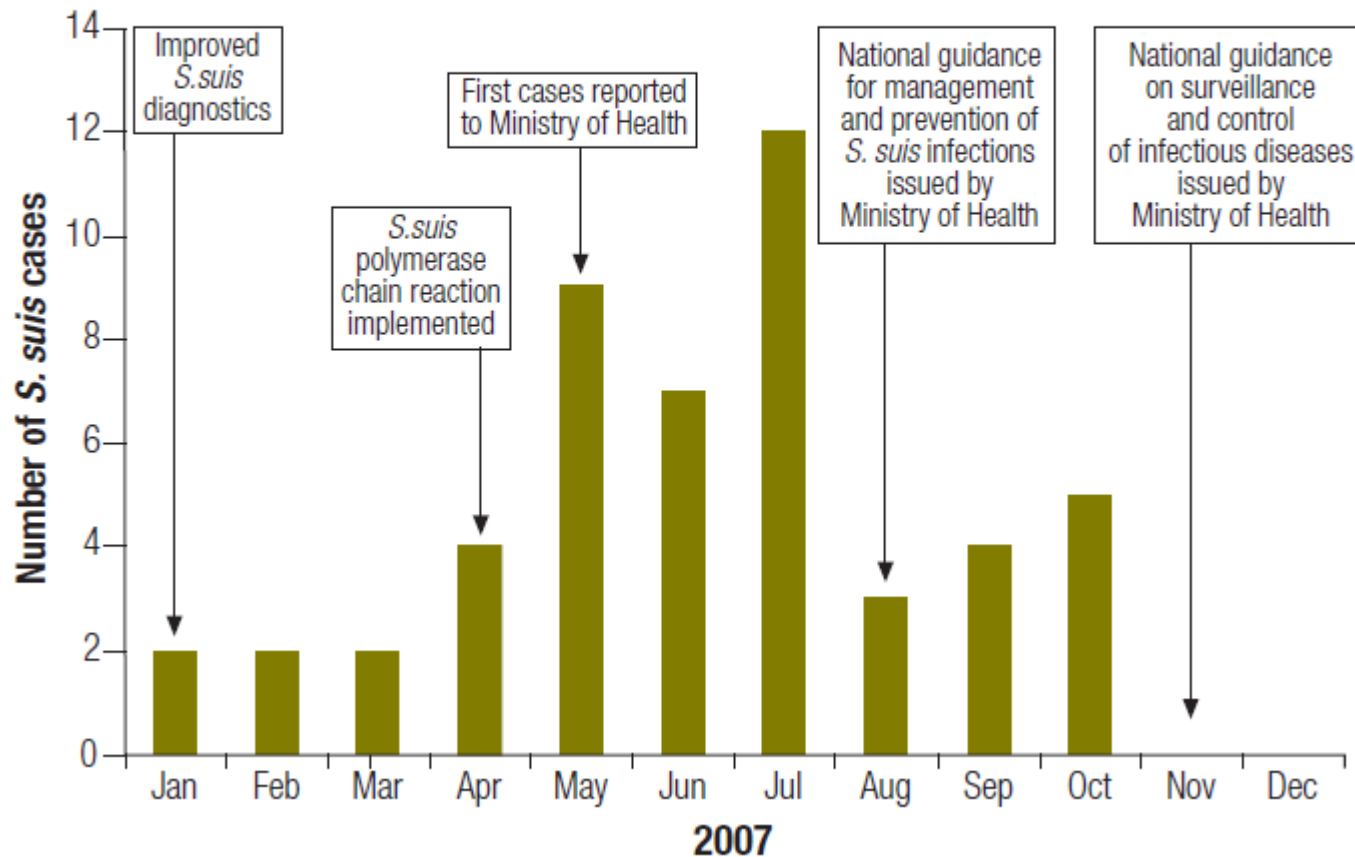


Data sources

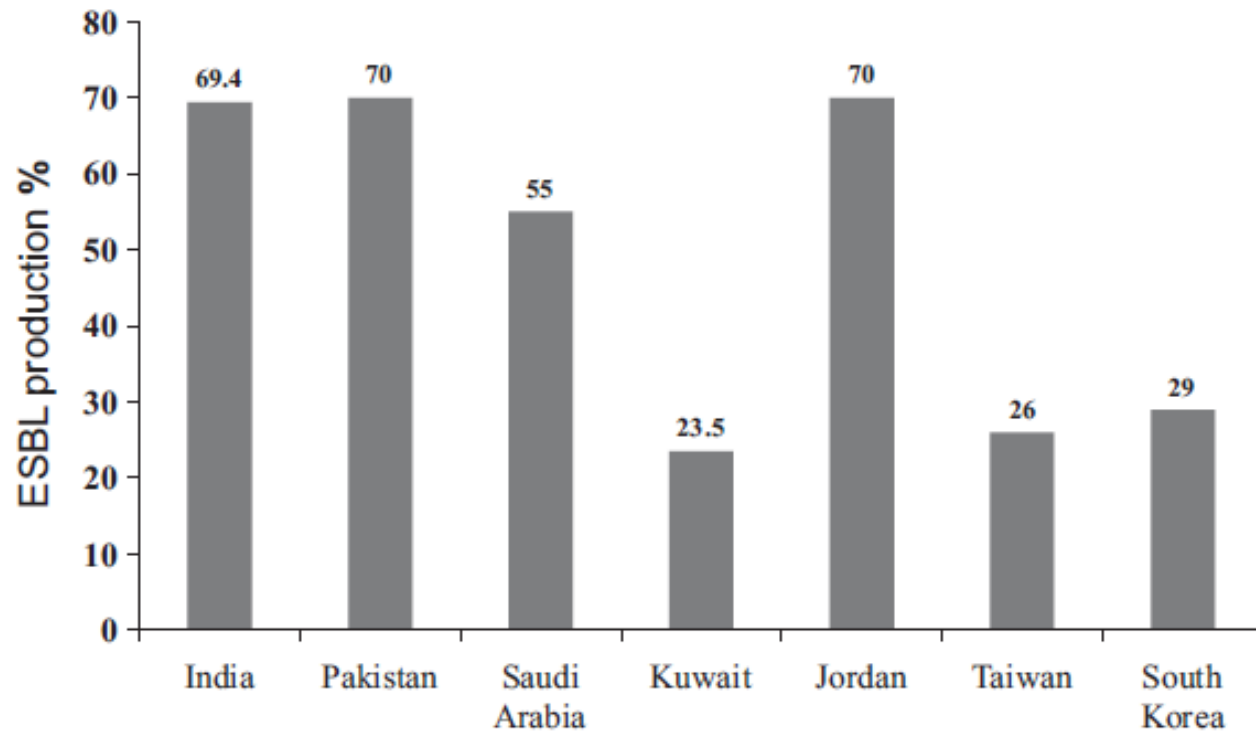
- Data on antibiotic resistance from Asia increasingly ending up in the literature
- But...

How reliable is identification?

Fig. 1. Number of *Streptococcus suis* cases diagnosed per month during 2007 at the National Hospital for Tropical Diseases



How reliable are resistance rates?



Lab issues resistance testing Asia

- Insufficient knowledge/training
- Insufficient funding
- Quality control often not in place
- No standard procedures
- No confirmation of unlikely resistances
- Errors in interpreting CLSI guideline (only use tables)
- Poor biosafety standards
- Poor waste management

→ Capacity strengthening required

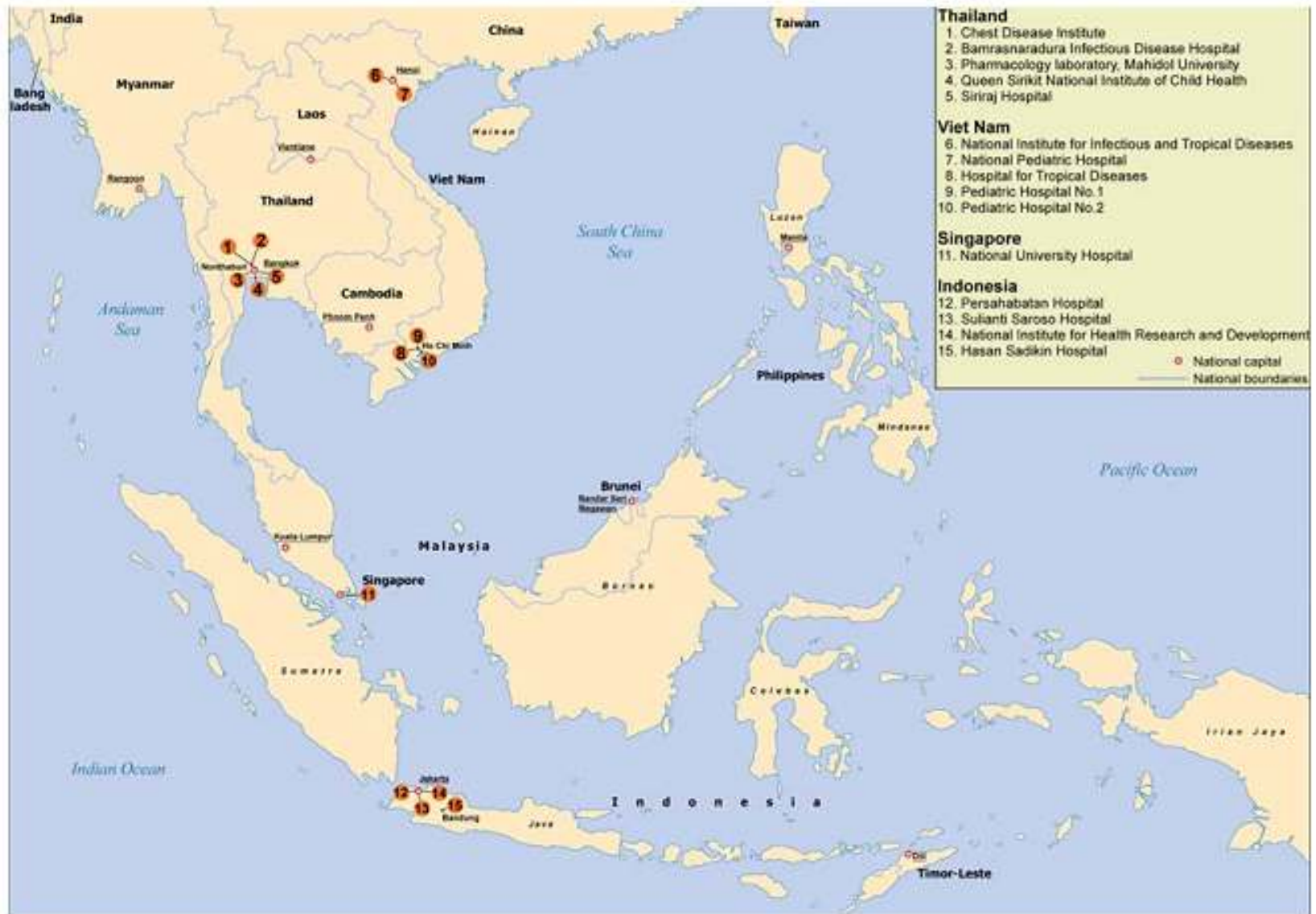


Figure 1. South East Asia Infectious Disease Clinical Research Network sites and laboratories.

Health in Action

Laboratory Capacity Building in Asia for Infectious Disease Research: Experiences from the South East Asia Infectious Disease Clinical Research Network (SEAICRN)

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Summary Points

- Enhancing laboratory capacity is essential for generating reliable and accurate data from clinical research, especially in resource-constrained settings.
- Local well-trained laboratory experts and scientists are important to research, and must participate actively in scientific activities and continuing education programs.
- Improving laboratory capacity is more than supplying new equipment and reagents; it also includes a long-term commitment to staff training, quality control, and biosafety.
- Improved laboratory capacity optimizes responses to an epidemic or an outbreak of a novel virulent pathogens, and can support international agendas

Capacity strengthening activities

- Infrastructure
 - Reliable electricity (UPS, generator, earthing)
 - Biosafety cabinets (don't use clean benches)
 - Equipment maintenance
 - Lab space, working area, benches
- Quality
 - Documentation (labelling, recording, reporting)
 - Internal/external quality assurance
 - Temperature logs (often pre-written)
 - Accreditation (for those up to it)

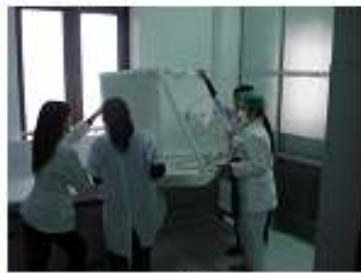




Making plans in 2008



Moving out



Temporary labs



090427



Demolition



Extending into balconies to enlarge laboratory space



Construction



Earthed power supply



Generator back-up



Finishing touches



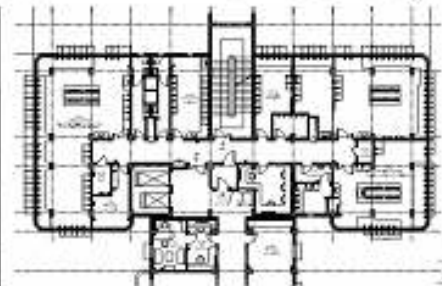
New labs ready



Moving in



Operational by July 2010



According to plans

Resistance Surveillance Project in Vietnam

- Monitor resistance in 15 hospitals by MoH
- **Auditing** labs and data quality
- Translate CLSI guidelines into Vietnamese

Over testing

S. aureus	P. aeruginosa	Acinetobacter	E. coli	Klebsiella
Amikacin	Amoxicillin/ clavulanic acid	Amoxicillin/ clavulanic acid	Cefoperazone	Nelitimicin
Amoxicillin/ clavulanic acid	Ampicillin/ sulbactam	Ampicillin	Cefoperazon/ sulbactam	Cefoperazone/ sulbactam
Ampicillin	Cefoperazone	Cefoperazone	Fosfomycin	Cefoperazone
Ampicillin/ sulbactam	Cefoperazon/ sulbactam	Cefoperazone/ sulbactam	Nelitimicin	
Cefepime	Cefotaxime	Cefuroxime	Amoxicillin	
Cefoperazone	Ceftriaxone	Cephalothin		
Cefotaxime	Cefuroxime	Chloramphenicol		
Cefoxitin	Chloramphenicol	Ertapenem		
Ceftazidime	Ertapenem	Nelitimicin		
Ceftriaxone	Nelitimicin	Norfloxacin		
Cefuroxim	Nitrofunratoin	Ofloxacin		
Cephalexin	Trimethoprim/ Sulfamethoxazol			
Cephalothin				
Ertapenem				
Fosfomycin				
Imipenem				
Piperacillin/ tazobactam				

Quality assurance issues

- Internal
 - Media / reagents not checked
 - Inoculum
- External
 - Problems receiving EQA panels
 - Local EQA schemes under development

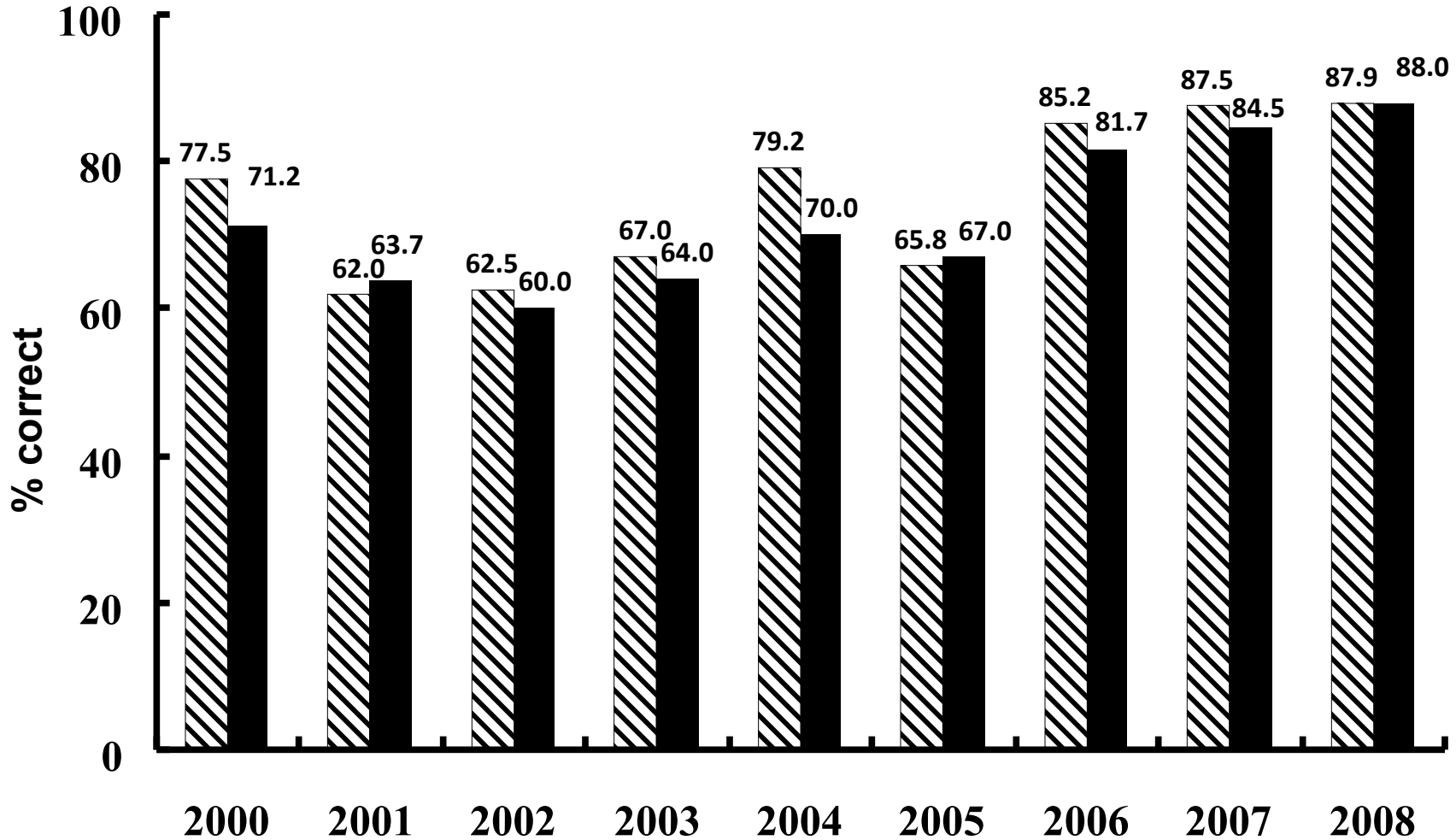
Experience with an external quality assurance scheme for antimicrobial susceptibility testing of *Neisseria gonorrhoeae* in India, 2001–2007

Table 1. Overall performance of laboratories participating in the Indian GASP EQAS for six strains and six antibiotics, 2001–2007

Antibiotic	Year [number incorrect*/number tested (percentage of all errors)]						
	2001	2002	2003	2004	2005	2006	2007
Penicillin	9/26 (34·6)	4/21 (19·0)	11/27 (40·7)	12/30 (40·0)	3/32 (9·4)	8/36 (22·2)	2/36 (5·8)
Ciprofloxacin	6/24 (25·0)	6/21 (28·6)	9/27 (33·3)	9/30 (30·0)	2/32 (6·3)	5/36 (13·9)	4/36 (11·1)
Nalidixic acid	10/23 (43·5)	7/21 (33·3)	10/27 (37·0)	8/30 (26·7)	0/29 (0·0)	3/36 (8·3)	0/36 (0·0)
Spectinomycin	7/24 (29·1)	6/21 (28·6)	10/27 (37·0)	6/30 (20·0)	3/32 (9·4)	1/36 (2·8)	0/36 (0·0)
Tetracycline	9/26 (34·6)	1/21 (4·8)	3/27 (11·1)	4/30 (13·3)	2/32 (6·3)	4/36 (11·1)	2/36 (5·8)
Total†	41/123 (33)	24/105 (22·8)	43/135 (31·8)	33/150 (26)	10/167 (6)	21/180 (11·6)	8/180 (4·4)

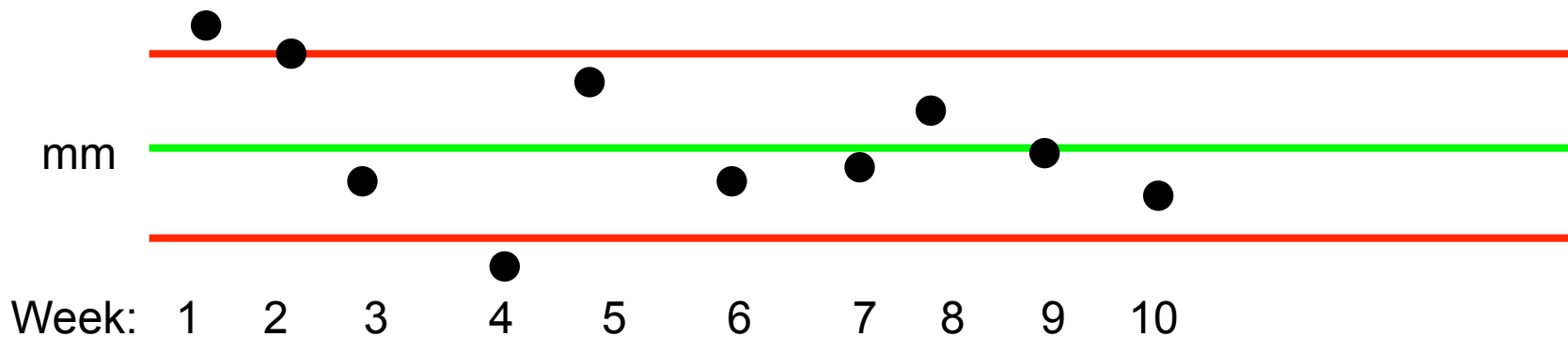


EQAS of Nepal laboratories for organism identification and susceptibility testing



Introducing simple QA

- Provide ATCC strains
 - *Escherichia coli*
 - *Klebsiella pneumoniae*
 - *Pseudomonas aeruginosa*
 - *Staphylococcus aureus*
- Test weekly for specific AB



Training training training

- Need for well trained staff at reference labs that can train others (even a fancy lab is as good as the people working in it)
- Know what to test, when to test and how to report
- Understand resistance phenotypes and know when to confirm unlikely resistances
- Can trouble shoot
- Be confident enough to counter the clinician!!

Key challenges

- Investment time/money with long term goals and not short term fixes
- Working towards accreditation is concrete goal but local circumstances can make it tough to adhere to high standards
- Commitment hospital/laboratory leaders
- EQA not always available but provide simple tools to improve quality
- Timely procurement of reagents that expire...
- Training
- Bring clinicians, pharmacists, microbiologists together



CHÀO MỪNG HOANG TỬ VƯƠNG QUỐC ANH ANDREW ĐẾN THAM
VA DỰ 'LE KHANH THANH PHONG XET NGHIEM CUA BENG VIEN
WELCOMES HRH THE PRINCE ANDREW TO OPEN THE LABORATORIES AT NHTD



BỆNH VIỆN BỆNH NHIỆT ĐỚI TRUNG ƯƠNG
NATIONAL HOSPITAL OF TROPICAL DISEASES

NƠI THỜ TỰM
VIỆN PHỤ SẢN





THANK YOU