

Development of web-based protocol system for obstetric care in a less developed country

Aditi Chebbi, Emma Parry, David Parry and Phurb Dorji

Holidaying in Bhutan!



Objective

- Development of protocols to improve consistency of care and assist in critical decision making.
- Would like to see a decrease in rates of maternal and child mortality
- Improve morale of medical staff
- Better services may lead to increase in attendance at birth

Where is Bhutan?



- Buddhist kingdom
- Borders meet India and China
- Population around 700,000
- Internet available since 2000

The big picture

Bhutan:

- Construction of new Perinatal unit
- Purchasing ultrasound machines for unit and training ultrasonographers and x-ray technicians
- Host designed protocols on hospital website
- Producing CDROM copies of protocols for distribution

New Zealand:

- Promoting accessibility of protocol for practitioners in rural NZ and other rural communities
- Improving links between Bhutan and NZ

Perinatal unit construction



Bhutan healthcare and Perinatal services

- Primary healthcare approach (similar to NZ's recently adopted approach)
- 4 tiered network
- Perinatal services
 - Covers childbirth and pregnancy
 - Social and economic implications
 - Attendance during childbirth is more important than hi-tech approach

Problems encountered

- High maternal and neonatal mortality and morbidity rates
 - 1 in 37 lifetime risk of maternal Death
 - (1 in 6000 in New Zealand)
 - 67/1000 babies die before age 1
 - (5/1000 in New Zealand)
- Bhutan's geographical difficulties
- High rates of unattended births

Rural centre



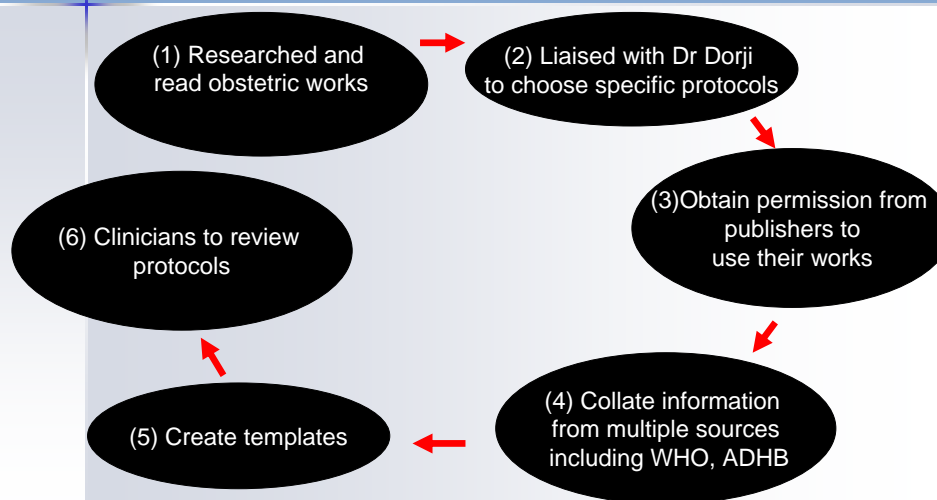
Problems encountered

- Choice of protocols to develop
- Method of developing protocols
- How do we make these services available to the communities most in need?

Web Protocols

- Used to support decision making, often in emergency situations
- Easy access
- Fast
- Diagrams to guide user
- Features such as; keyword search, flow diagrams, links to relevant protocols.
- Simple english is used!

Protocol development



Protocol example (Word)

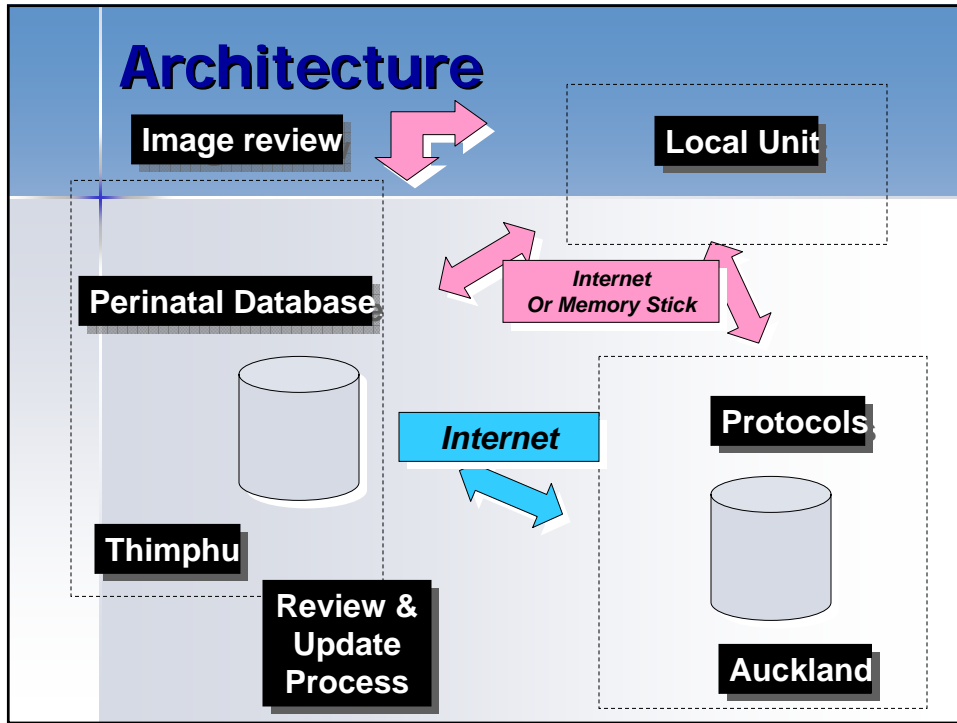
Element	Comment
Name	Name of protocol
Definition	
Keywords	Used for searching
Diagnosis	For diagnostic protocols
Diagnostic Step	
Procedure	For procedural protocols
Procedure Step	
Audience	Intended user, includes country and location
Evidence	A small selection of the supporting evidence
Author	Multiple Authors Possible
Last Update	
Review Date	

With figures to guide procedures

Protocol example (XML)

```
<Root_Element>
  <Name>Cord prolapse</Name>
  <Definition>
The cord that normally presents itself is within intact membranes.
When the membranes rupture, the cord prolapses. This is an
emergency as cord compression and/or occlusion can cause fetal
asphyxia.
  </Definition>
  <Keywords>
    <Keyword>Rupture of Membrane</Keyword>
    <Keyword>Prolapse</Keyword>
  </Keywords>
  <Diagnosis>
    <Diagnostic_step>Palpable cord on vaginal exam</Diagnostic_step>
    <Diagnostic_step>Observed cord protruding onto
vulva</Diagnostic_step>
  </Diagnosis>
</Root_Element>
```

Figure 1: XML Protocol Fragment



Protocols developed

Anaemia	Breech delivery
Misoprostil administration	Acute tocolysis
Cord prolapse	Shoulder dystocia
Cardiac prophylaxis in labour	Cervical incompetence
Diabetes care in labour	Forceps delivery
Ventouse delivery	Preterm labour
Prelabour rupture of membranes	Urinary tract infection in pregnancy
Preparation for operative vaginal delivery	Post-partum haemorrhage

Currently working on Emergency tocolysis

Accessing Protocols

- Website address:
<http://www.mfm.auckland.ac.nz/Protocols/menu.html>

Future work

- Currently finished implementing initial set of protocols in Bhutan
- Trained staff to use protocols and equipment
- Will continue to provide support services until protocols can be driven by local community

Thanks to...

- University of Auckland - funders
- Julian and Christine Magee – funders
- Dr Emma Parry – Dept O&G, U of A
- Dave Parry – Computer and Info sciences, AUT
- Dr . Phurb Dorji – Thimphu Hospital
- UNICEF, WHO, ADHB