Session objectives

- Overview of project aims and objectives

- Research protocols and stages including preliminary findings of formative research with community health workers and device selection overview

Project overview

- Use of improved tools for measuring respiratory rate and oxygen saturation among community health workers: subSaharan Africa and Southeast Asia

- To identify the most accurate, acceptable, scalable and user-friendly respiratory rate timers and pulse oximeters to support community health workers (CHWs) and frontline health facility workers (FLHFWs) in the detection of the signs of pneumonia in four low-income countries – Cambodia, Ethiopia, South Sudan and Uganda.

- Timescales: November 2013 – June 2015 (6 research stages)
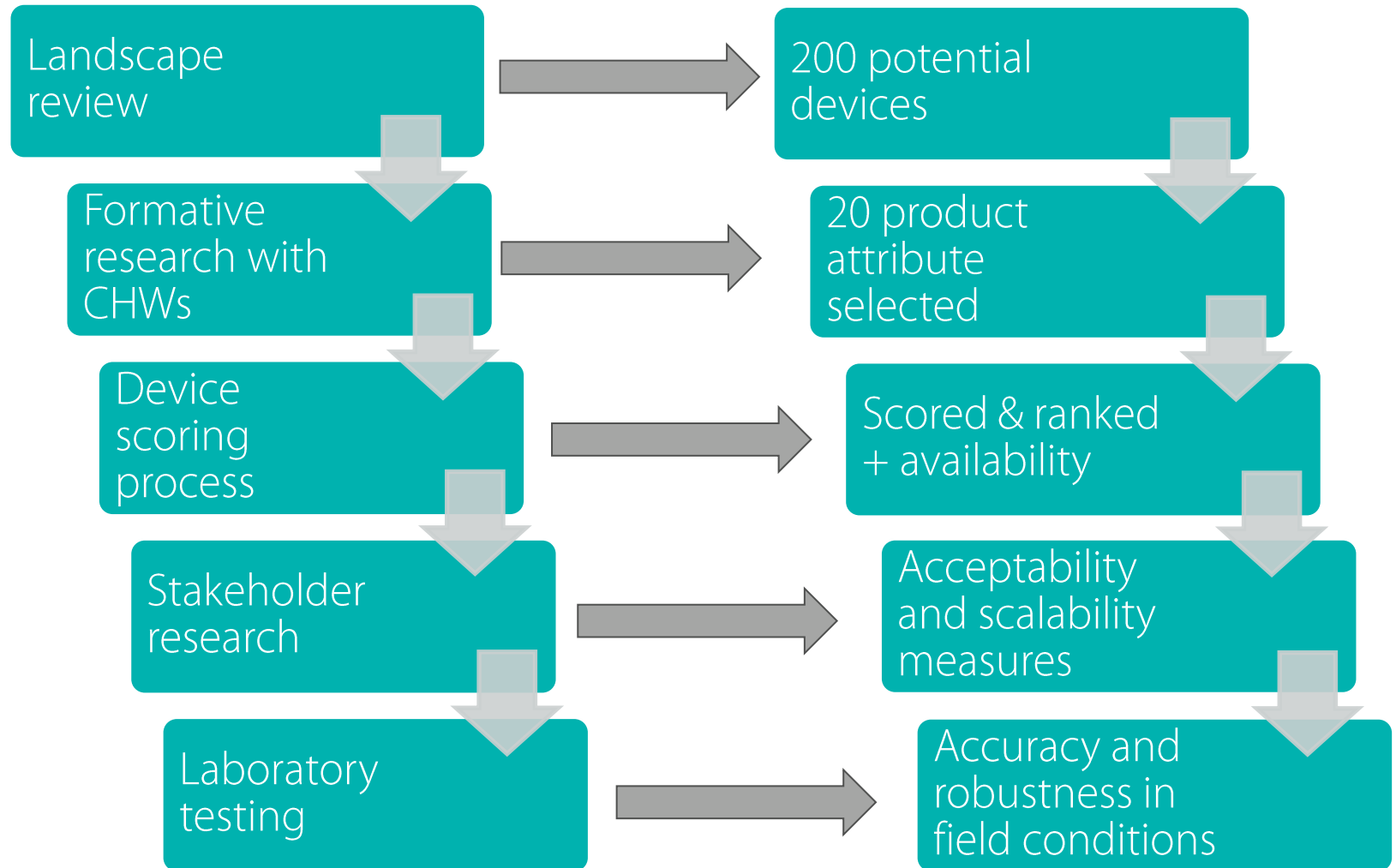
Project phases and objectives

Device selection

Accuracy evaluation

Field testing

Device selection process

Landscape review	200 potential devices
Formative research with CHWs	20 product attribute selected
Device scoring process	Scored & ranked + availability
Stakeholder research	Acceptability and scalability measures
Laboratory testing	Accuracy and robustness in field conditions

Formative research – Key themes

- A 'felt' need for tools to detect the signs of pneumonia was expressed by all CHWs

- Current barriers to pneumonia diagnosis and management
  - ➢ Community level barriers – lack of trust
  - ➢ Issues with current devices
    - o Suitability; usability and durability

- Ideal device characteristics

- No experience of pulse oximetry amongst CHWs

Key themes : 'Felt' need

"I use my digital watch sometimes but that is just improvising. We need more reliable tools. I use it because I don't want to dispense amoxyl without proof that a child has pneumonia." - Village health team member, Uganda

"I had received a watch through ICCM programme three years ago, but now it is not working and I am using my own mobile phone." - Health extension worker, Ethiopia

Key themes – Community barriers

"Parents like the timer and they trust what I say to them only if I have used the timer to assess their child."
- Village health team member, Uganda

"When a child is restless or crying it is hard to count RR…thus I tell the parent to wait until the child calms down. But this takes several times and the parents lack patience, and sometimes ask to leave without getting treatment." – phone"
- Health extension worker, Ethiopia

Key themes – Device issues

"For me the UNICEF timer is time consuming and labour intensive." - Village health team member, Uganda

"Yeah in area of pneumonia because the tools we are currently using are not working well, the respiratory timer makes a lot of noise which can scare away the child."
- Community drug distributor, South Sudan

Key themes – Device Issues

"I would make a device which would not malfunction immediately and doesn't work with dry cells."

- Health extension worker, Ethiopia

Key themes – Ideal device characteristics

"I would place it on the child's chest or any part of the body and after a short while it would indicate whether or not a child has pneumonia, that way I would not have to count and the results would be accurate."

- Village health team member, Uganda

"I will make a multi-functional and fast device, which limits my role only in registration and requesting information."

- Health extension worker, Ethiopia

Device scoring process

Device availability
1 = not available
2 = available 6 months
3 = available

Total score

Attribute score
Score = 0-3

X

Attribute ranking
Score = 1-5

Example attributes: Usability; high level of decision support; automation of diagnosis; high accuracy of measured/calculated result
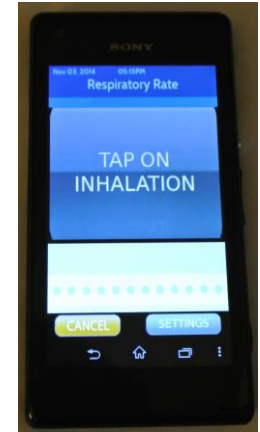
Possible devices for evaluation

Respiratory rate devices

Improved UNICEF timer

Counting beads

Mobile phone application – Smart phone

Mobile phone application – Feature phone

Pulse oximeters

Handheld device

Fingertip device

Mobile phone POx

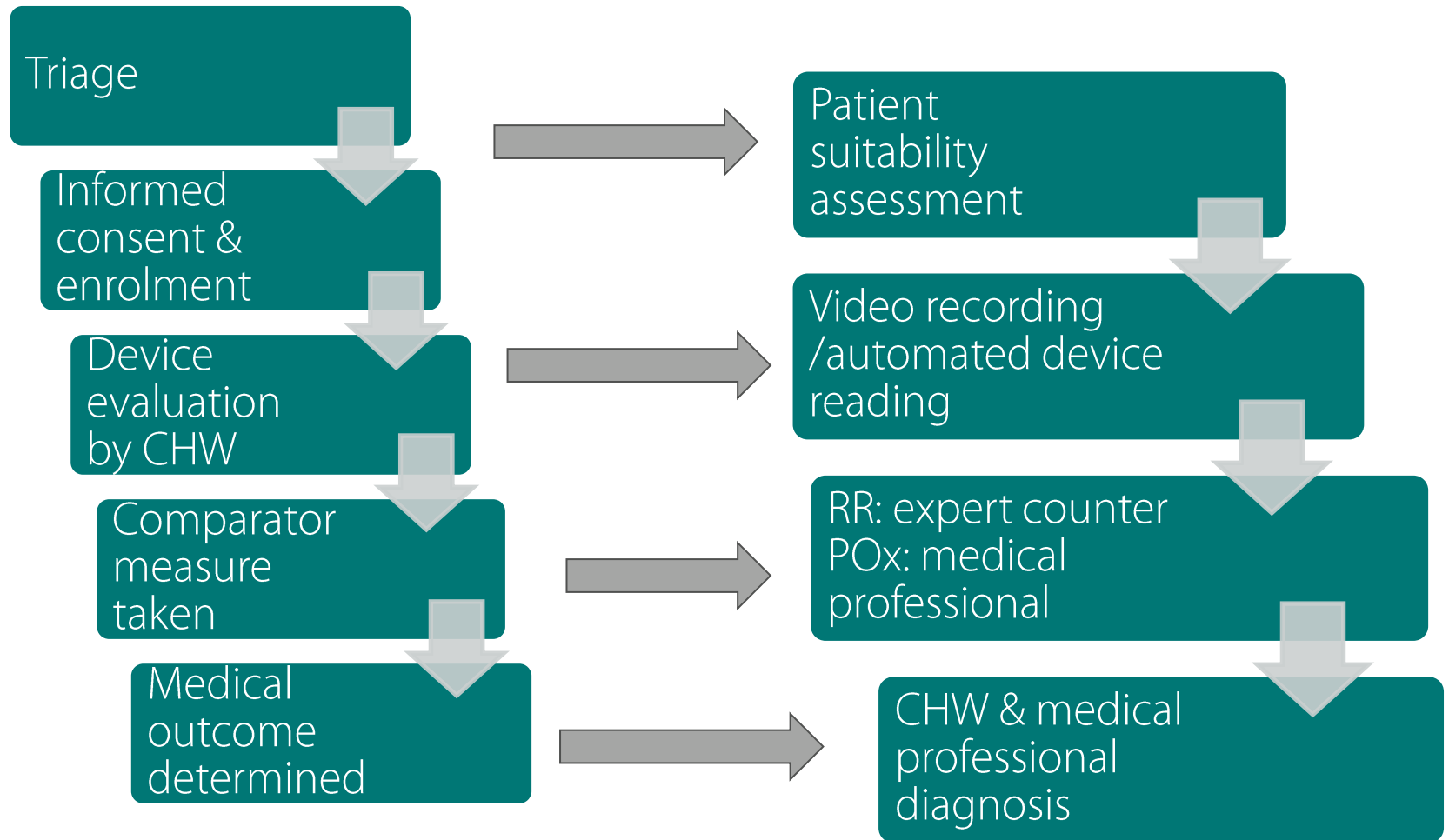# Laboratory testing

- Working with TUV Rheinland

- Testing up to 12 devices

- Two main testing protocols:
  - Functional testing – can devices function correctly
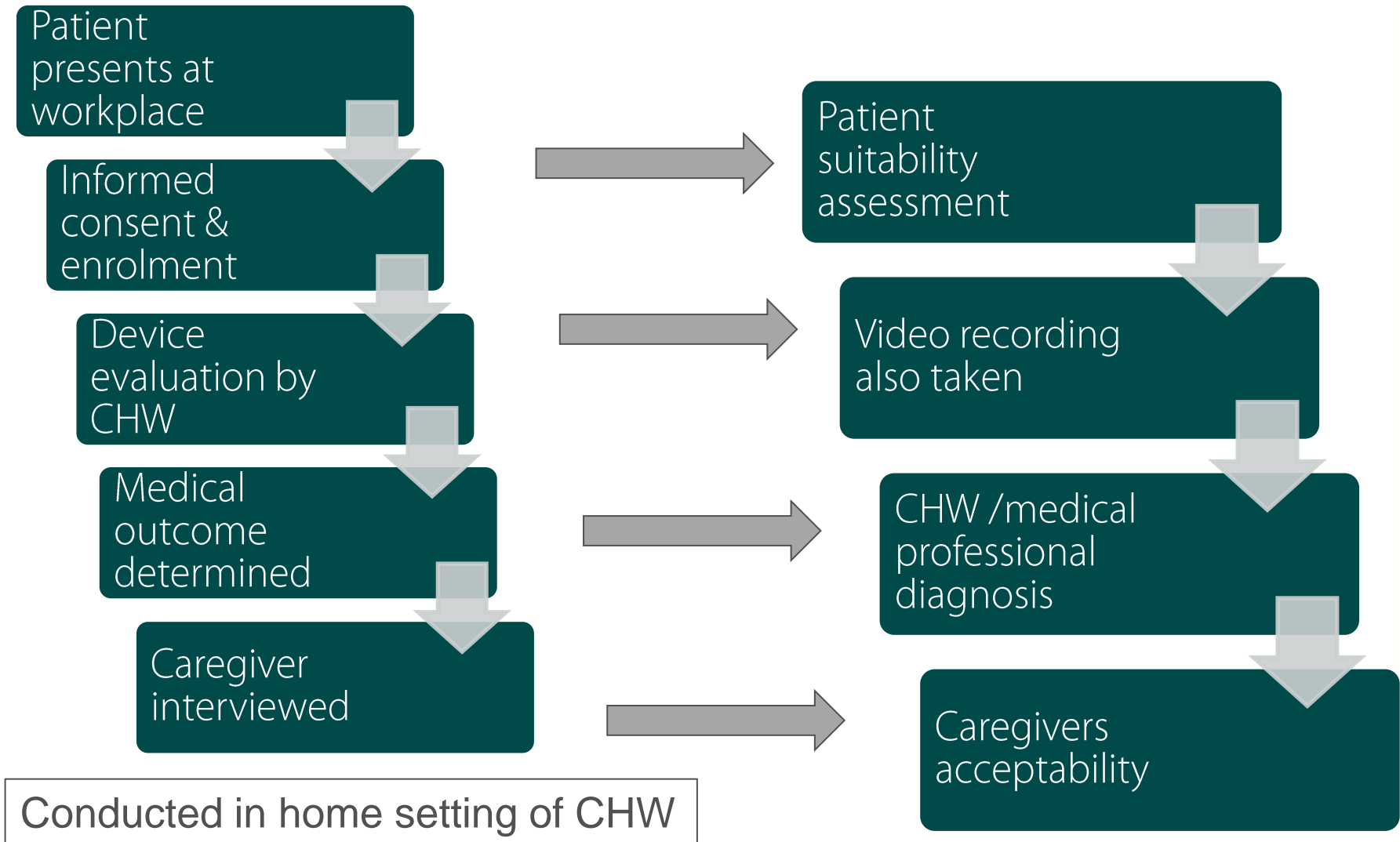 - Environmental testing – are devices fit for purpose

Accuracy evaluation process

Triage

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Informed consent & enrolment

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Device evaluation by CHW

↓

Comparator measure taken

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Medical outcome determined

→ Patient suitability assessment

↓

Video recording /automated device reading

↓

RR: expert counter POx: medical professional

↓

CHW & medical professional diagnosis

Conducted in four hospital sites – one in each country

Field testing process

Patient presents at workplace

→ Patient suitability assessment

Informed consent & enrolment

→ Video recording also taken

Device evaluation by CHW

Medical outcome determined

→ CHW /medical professional diagnosis

Caregiver interviewed

→ Caregivers acceptability

Conducted in home setting of CHW