World Health Organization | Patient Safety

A World Alliance for Safer Health Care

The World Health Organization Safe Surgery Checklist

Alvin Kwok, MD, MPH

World Health Organization

Harvard School of Public Health

- **Surgery is a public health issue**
- **234 million surgical procedures per year**
  - Outnumbers childbirth and HIV
- **Surgery is associated with considerable risk of complications and death**
  - At least 7 million disabling complications worldwide each year
  - At least 1 million deaths worldwide each year

- **Preventable complications:**
  - There are between 1500 and 2500 wrong site surgery incidents every year in the US [1]
  - An analysis of 1256 incidents involving general anaesthesia in Australia showed that pulse oximetry on its own would have detected 82% of them [2]
  - Giving antibiotics within one hour before incision can cut the risk of surgical site infection by 50% [3,4]

[1] Seiden, Archives of Surgery, 2006.
[2] Webb, Anaesthesia and Intensive Care, 1993.
[3] Bratzler, The American Journal of Surgery, 2005.
[4] Classen, New England Journal of Medicine,1992.

Reality Check:

Currently, hospitals do MOST of the right things, on MOST patients, MOST of the time.

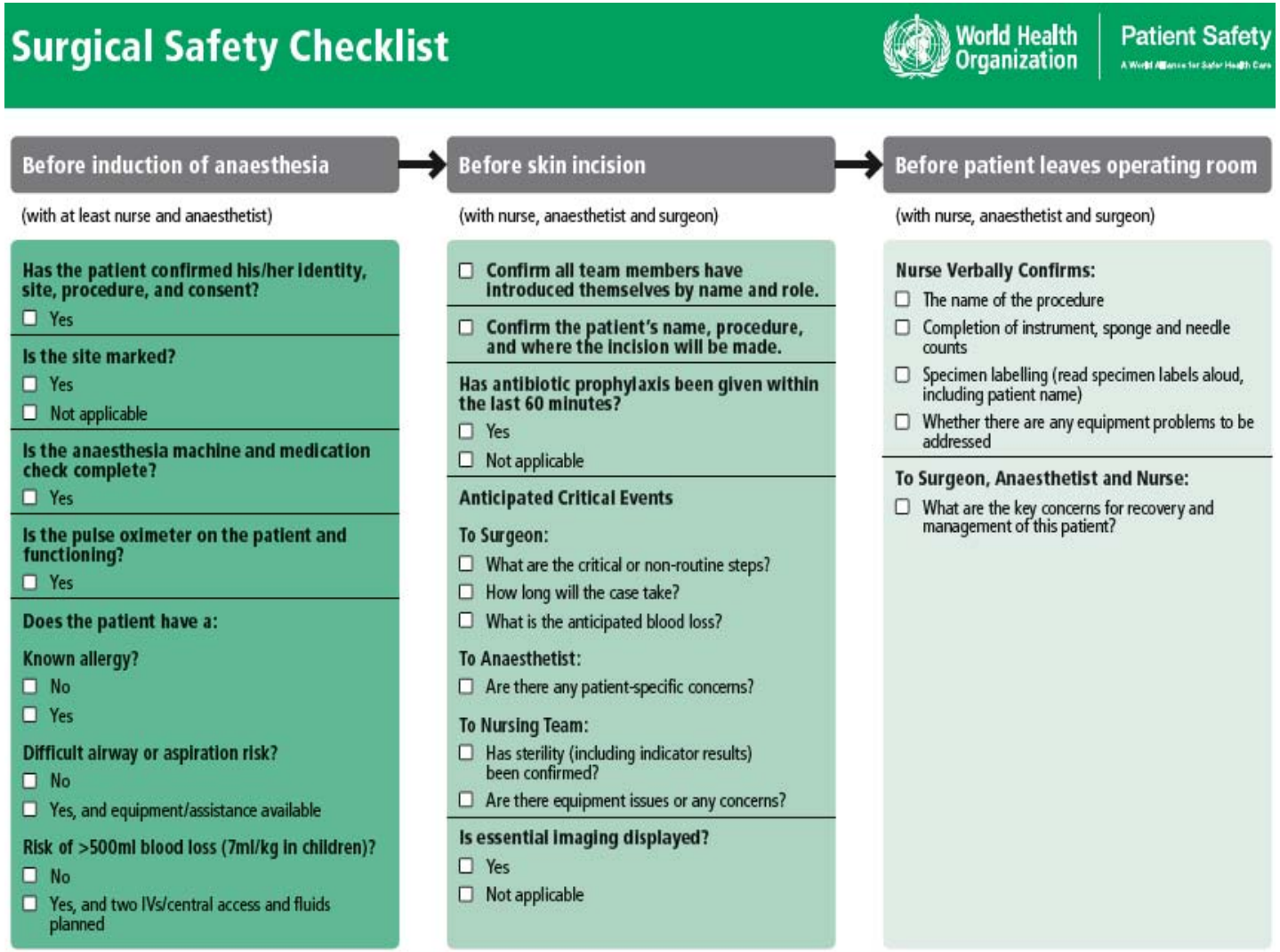
The Checklist helps us do ALL the right things, on ALL patients, ALL the time

Outline

- Surgical Safety Checklist Pilot Study (NEJM 2009)

- Surgical Safety Checklist and Pulse Oximetry Pilot Study

Surgical Safety Checklist



Surgical Safety Checklist

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Before induction of anaesthesia
(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?
- ☐ Yes

Is the site marked?
- ☐ Yes
- ☐ Not applicable

Is the anaesthesia machine and medication check complete?
- ☐ Yes

Is the pulse oximeter on the patient and functioning?
- ☐ Yes

Does the patient have a:

Known allergy?
- ☐ No
- ☐ Yes

Difficult airway or aspiration risk?
- ☐ No
- ☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?
- ☐ No
- ☐ Yes, and two IVs/central access and fluids planned

Before skin incision
(with nurse, anaesthetist and surgeon)

- ☐ **Confirm all team members have introduced themselves by name and role.**
- ☐ **Confirm the patient's name, procedure, and where the incision will be made.**

Has antibiotic prophylaxis been given within the last 60 minutes?
- ☐ Yes
- ☐ Not applicable

Anticipated Critical Events

To Surgeon:
- ☐ What are the critical or non-routine steps?
- ☐ How long will the case take?
- ☐ What is the anticipated blood loss?

To Anaesthetist:
- ☐ Are there any patient-specific concerns?

To Nursing Team:
- ☐ Has sterility (including indicator results) been confirmed?
- ☐ Are there equipment issues or any concerns?

Is essential imaging displayed?
- ☐ Yes
- ☐ Not applicable

Before patient leaves operating room
(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:
- ☐ The name of the procedure
- ☐ Completion of instrument, sponge and needle counts
- ☐ Specimen labelling (read specimen labels aloud, including patient name)
- ☐ Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- ☐ What are the key concerns for recovery and management of this patient?

The Checklist was piloted in 8 cities…

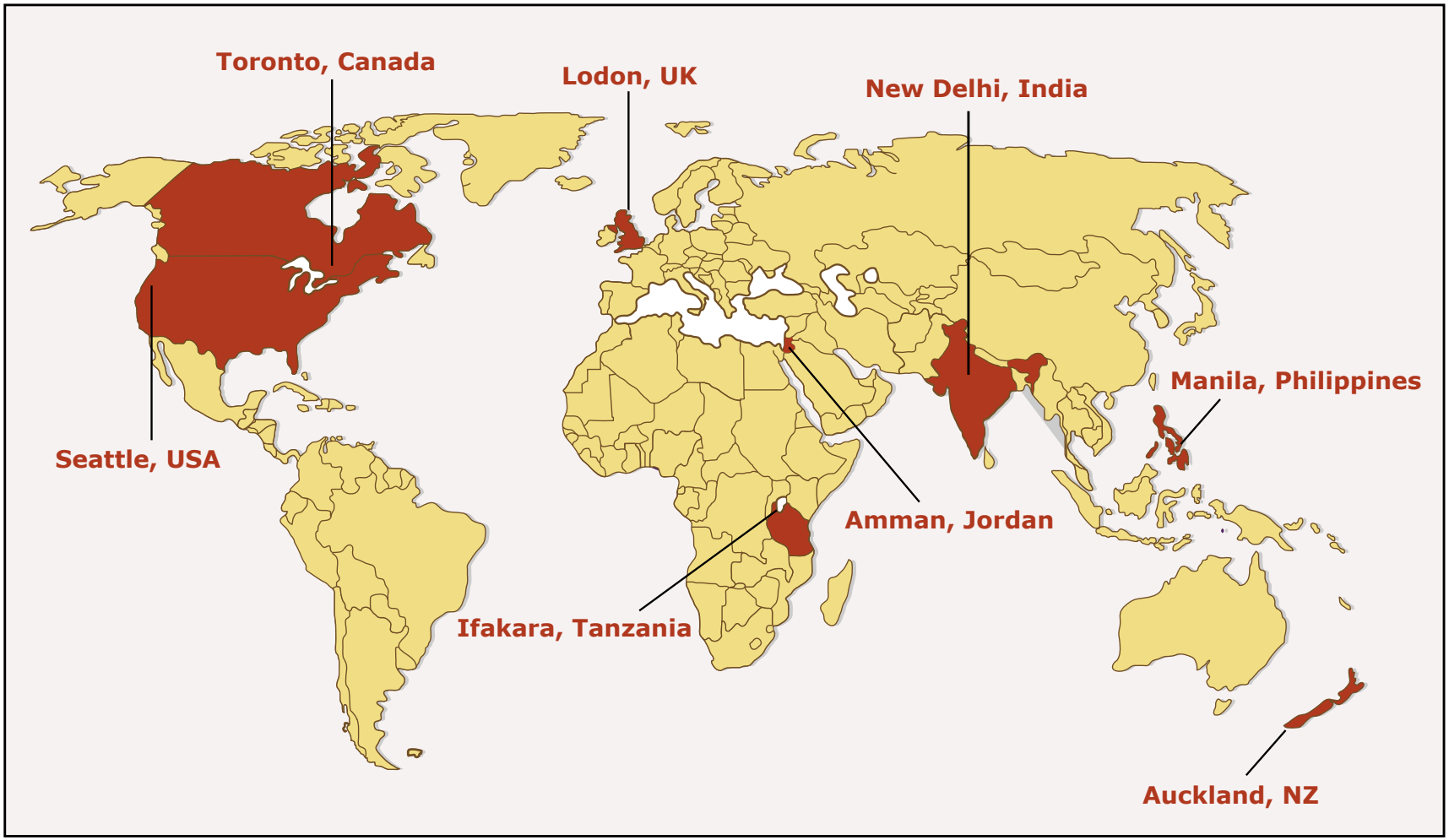


Image by MIT OpenCourseWare.

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

...and was found to reduce the rate of postoperative complications and death by more than one-third!

Results:
All sites

	Baseline	Checklist	P value
Cases	3733	3955	-
Death	1.5%	0.8%	0.003
Any Complication	11.0%	7.0%	<0.001
Surgical Site Infection	6.2%	3.4%	<0.001
Unplanned Reoperation	2.4%	1.8%	0.047

Haynes et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. New England Journal of Medicine 360:491-9. (2009)

Change in Death and Complications by Income Classification

	Change in Complications	Change in Death
High Income	10.3% -> 7.1%*	0.9% -> 0.6%
Low and Middle Income	11.7% -> 6.8%*	2.1% -> 1.0%*

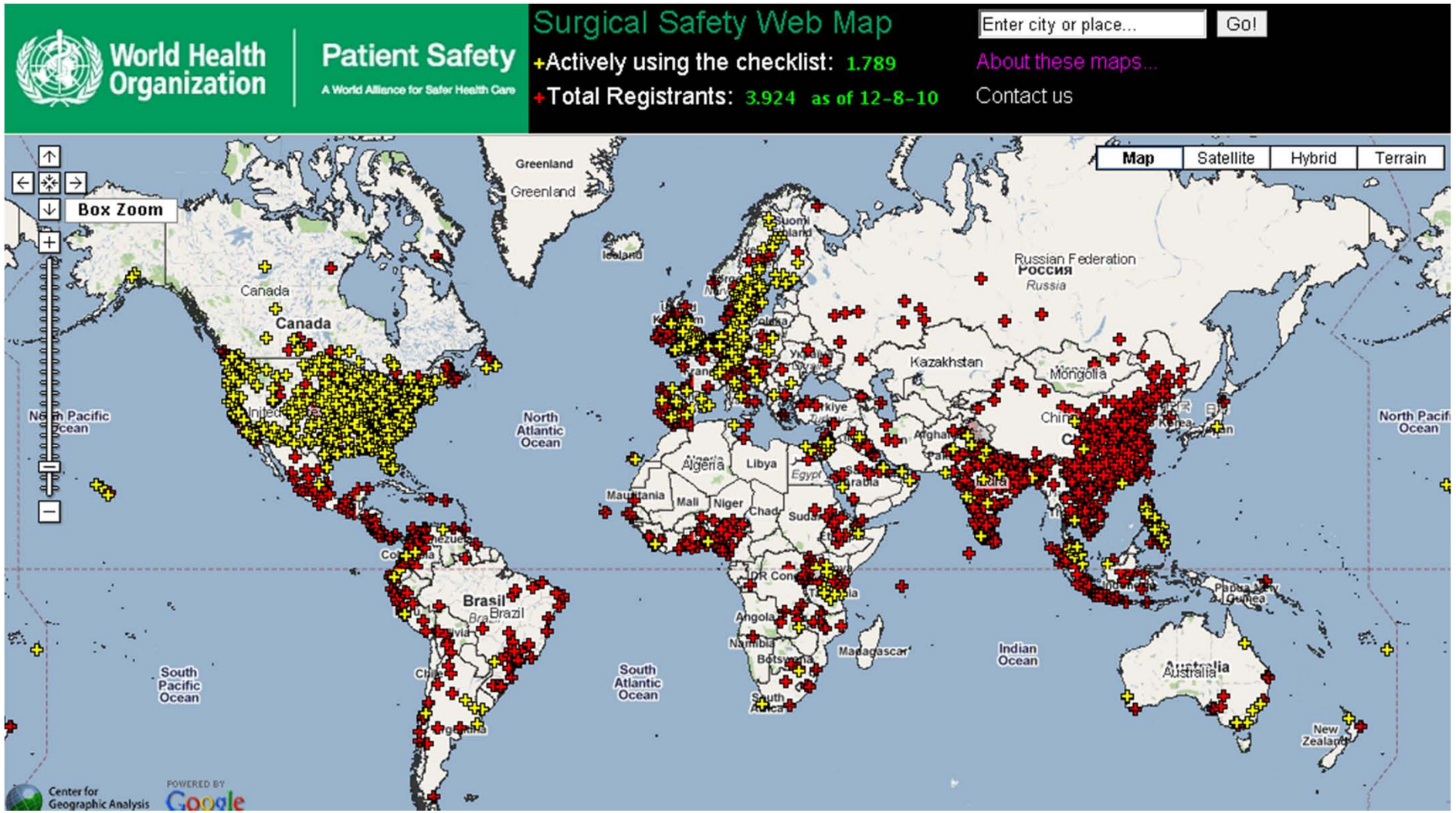
Haynes et al.

A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population.

New England Journal of Medicine 360:491-9. (2009)

* $p<0.05$

Surgical Safety Checklist Worldwide



Surgical Safety Checklist

University Teaching Hospital
Lusaka, Zambia

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Image courtesy of The Neenan Company on Flickr.

Pulse Oximetry

- Standard of safe anaesthesia and surgery
- High-income countries
  - *Present in virtually all operating rooms*
- Low-income countries
  - *Absent from >50% of operating rooms*

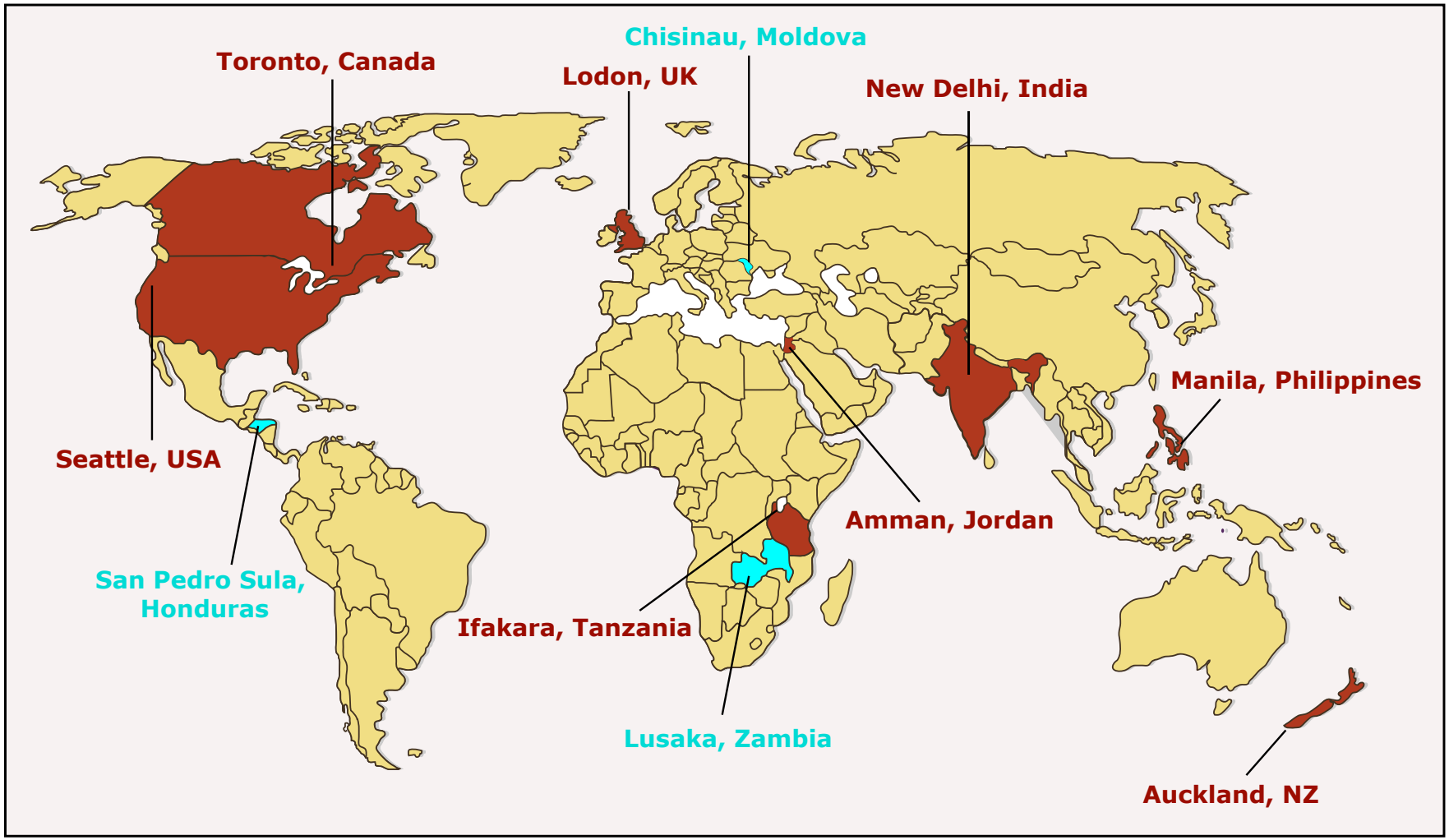
Funk et al Lancet 2010

Surgical Safety Checklist and Pulse Oximetry Pilot Study

- **Aim #1:** To pilot study the effect of checklist and pulse oximetry implementation on mortality

- **Aim #2:** To measure the effects of pulse oximetry training by monitoring hypoxemia rates during surgery

Three pilot sites…



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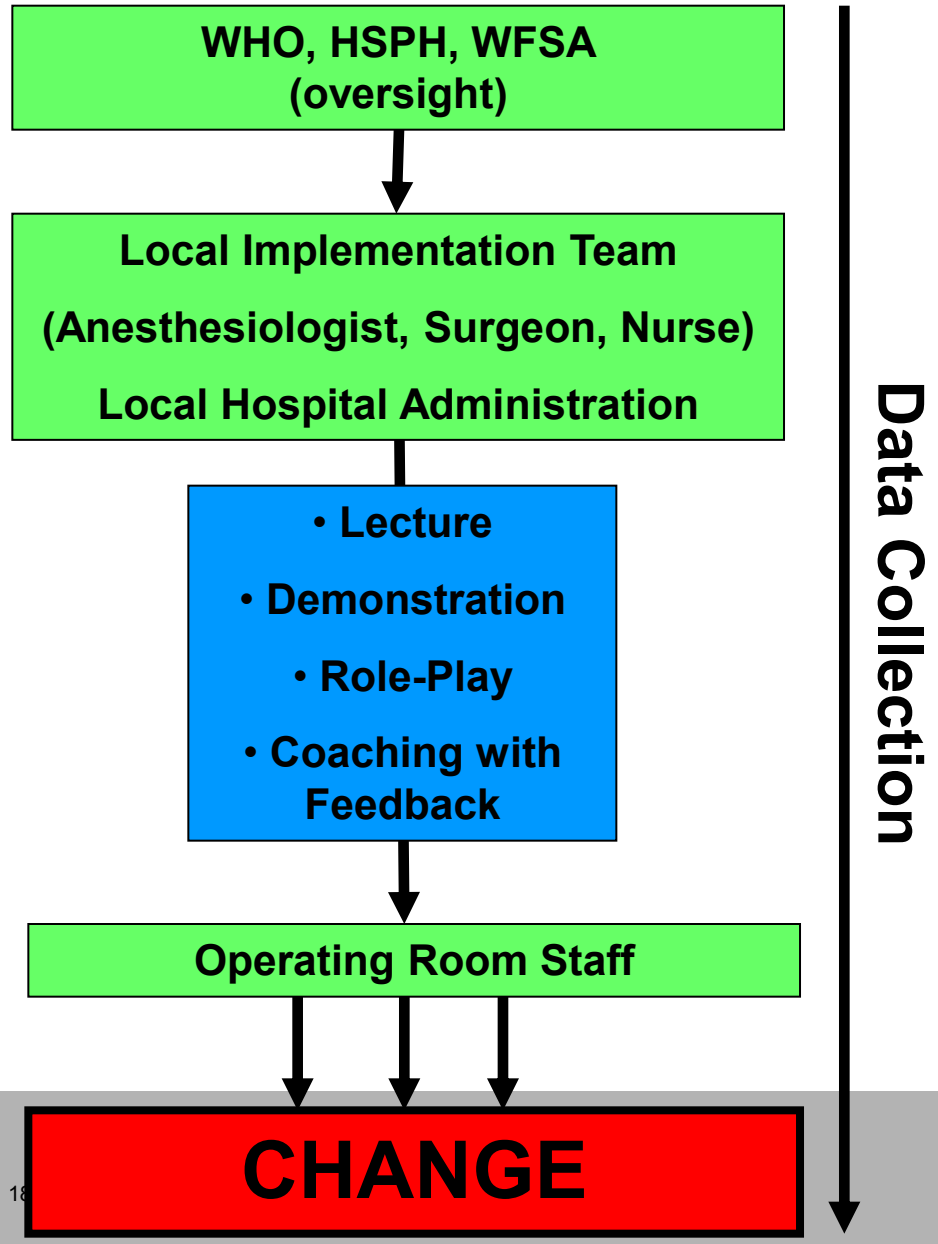
Implementation/Intervention Plan

Principles:

1. Implementation Team
2. Lecture
3. Demonstration
4. Role-Play
5. Coaching with Feedback




HELION
PHILIPS


Surgical Safety C

- Using the Checklist we can save lives and prevent complications
- Pulse oximetry is an essential part of safe surgery

↘

- Implementation of the Checklist and Pulse Oximetry can improve surgical outcomes

↘

- Implementation of the Checklist and Pulse Oximetry can improve surgical outcomes around the world

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A World Alliance for Safer Health Care

The World Health Organization Safe Childbirth Checklist Program

Priya Agrawal, MD MPH

World Health Organization

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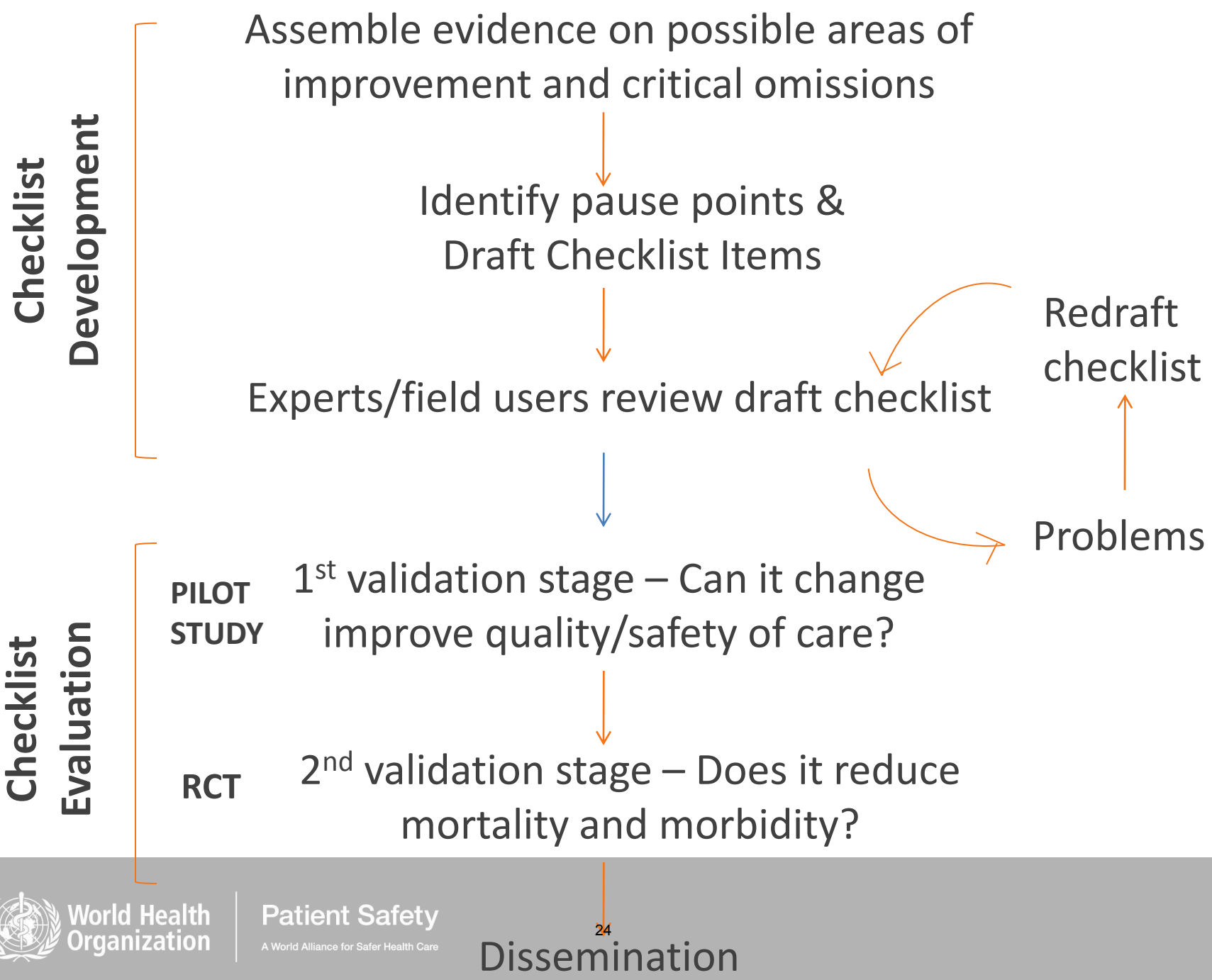
Checklist Development
Assemble evidence on possible areas of improvement and critical omissions
Identify pause points & Draft Checklist Items
Experts/field users review draft checklist
Redraft checklist
Problems
Checklist Evaluation
PILOT STUDY
1st validation stage – Can it change improve quality/safety of care?
RCT
2nd validation stage – Does it reduce mortality and morbidity?
Dissemination

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The magical ingredient?

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

Revised 1 / 2009

Safer Childbirth

130 Million Births worldwide each year

350,000 Maternal Deaths

Infection
Hemorrhage
Hypertensive disorders
Prolonged/obstructed labor

4 Million Neonatal Deaths

(3 million Early Neonatal Deaths)

Infection
Asphyxia
Prematurity

3.3 Million Stillbirths

(1 million intrapartum-related)

Poor intrapartum fetal monitoring
Poor neonatal resuscitation

Avoidable

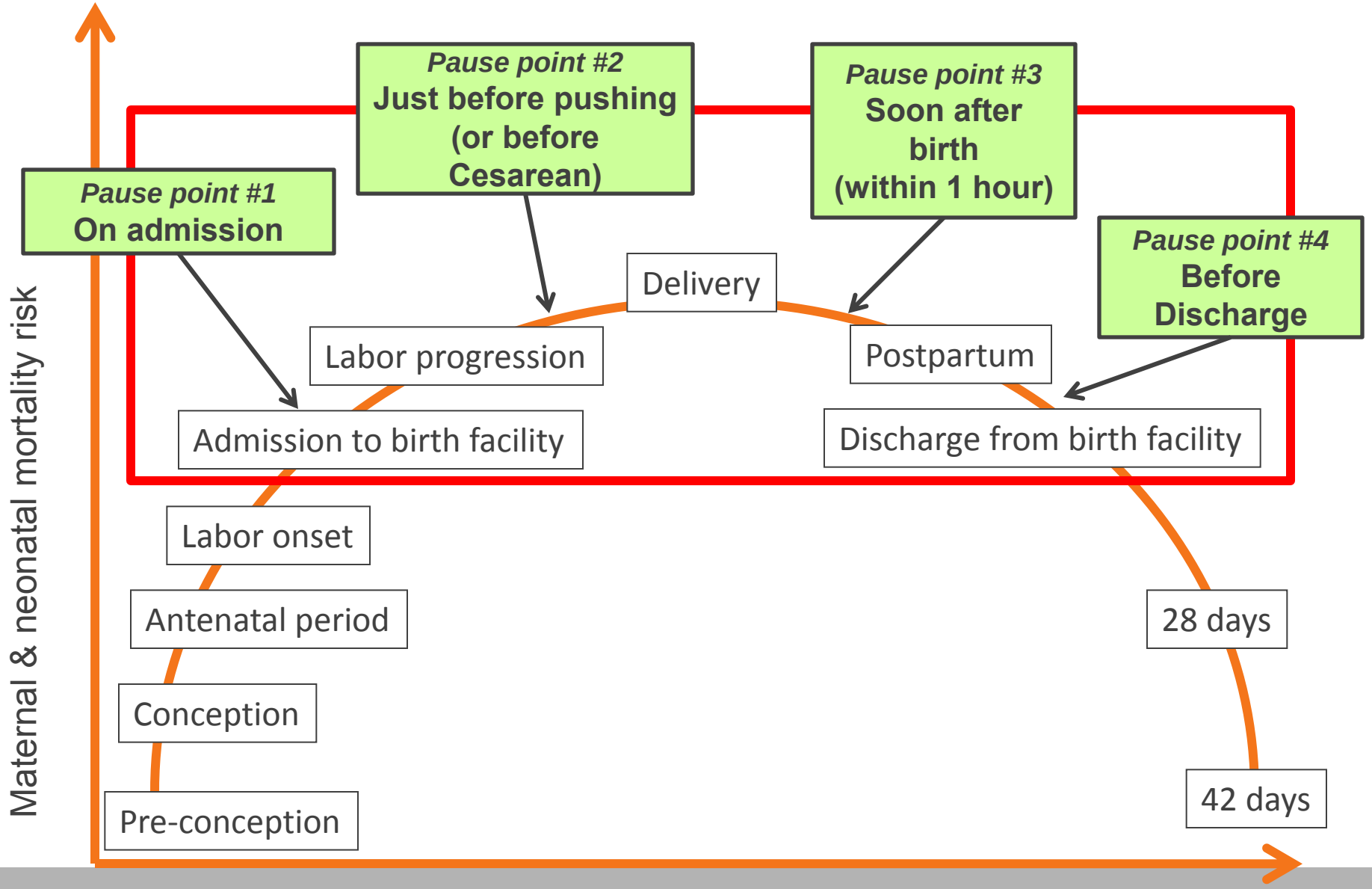
Different challenge, similar solution

- 99% of burden is in resource-poor settings
- Extremely variable level of training of caregiver
- High-risk period could cover days, rooms, caregivers, facilities
- No obvious team structure
- Woman is awake and ‘well’
- Rich evidence-base available and proven interventions are inexpensive

Sources Informing Checklist Content

- WHO published guidelines
- Evidence-based literature
- Expert consensus
- Collaborator feedback
- Mortality and near-miss audits

Pause Points



Program Progress

Review evidence – Starting Oct 2008

International Consultation – July 2009

Development of Safe Childbirth Checklist draft content

Expert Panel Meeting #1 – Nov 2009

“Usability Feedback Cycle” Field Development & Checklist Modification

Expert Panel Meeting #2 – May 2010

WHO Partners

Patient Safety: Gerald **Dziekan**, Angela **Lashoher**, Claire **Lemer**
Child & Adolescent Health: Rajiv **Bahl,** Wilson **Were**
Making Pregnancy Safer: Matthews **Mathai**, Severin **Ritter von Xylander,** Jelka **Zupan**
Reproductive Health & Research: Mario **Merialdi**

Expert Collaborators

Sabaratnam **Arulkumaran,** Mohamed **Bassiouny,** Kate **Beaumont,** Staffan **Bergstrom,** Shereen **Bhutta,** Zulfiqar **Bhutta,** Ann **Blanc,** Flavia **Bustreo,** Oona **Campbell,** Waldemar **Carlo,** Meena **Cherian,** Jo **Cox,** Susan **Crowther,** Gary **Darmstadt,** Louise **Day,** Jot **Dhadialla,** Mark **Dybul,** Barbara **Farlow,** Lynn **Freedman,** Zhao **Gengli,** Wendy **Graham,** Kathleen **Hill,** Justus **Hofmeyr,** Julia **Hussein,** AK **Jana,** Cate **Kamau,** Unni **Karunakara,** Khalid **Khan,** Grace **Kodindo,** BS **Kodkany,** Uma **Kotagel,** Barbara **Kwast,** Tina **Lavender,** Joy **Lawn,** Gwyneth **Lewis,** Sompop **Limpongsanurak,** Bridget **Lynch,** Deborah **Maine,** Rose **Malay,** Rashad **Massoud,** Alex **Matthews,** Colin **McCord,** Claudia **Morrissey,** Nester **Moyo,** Margaret **Nakakeeto,** Susan **Neirmeyer,** Padmanaban **Packirisamy,** Naren **Patel,** Robert **Pattinson,** Vinod **Paul,** Craig **Rubens,** Harshad **Sanghvi,** Harshalal **Seneviratne,** Susan **Sheridan,** Sara **Stulac,** Youssef **Tawfik,** Nynke **van den Broek,** Claudia **Vera,** Phommady **Vesaphong,** Jean-José **Wolomby,** David **Woods,** Linda **Wright,** Blair **Wylie,** Juliana **Yartey**

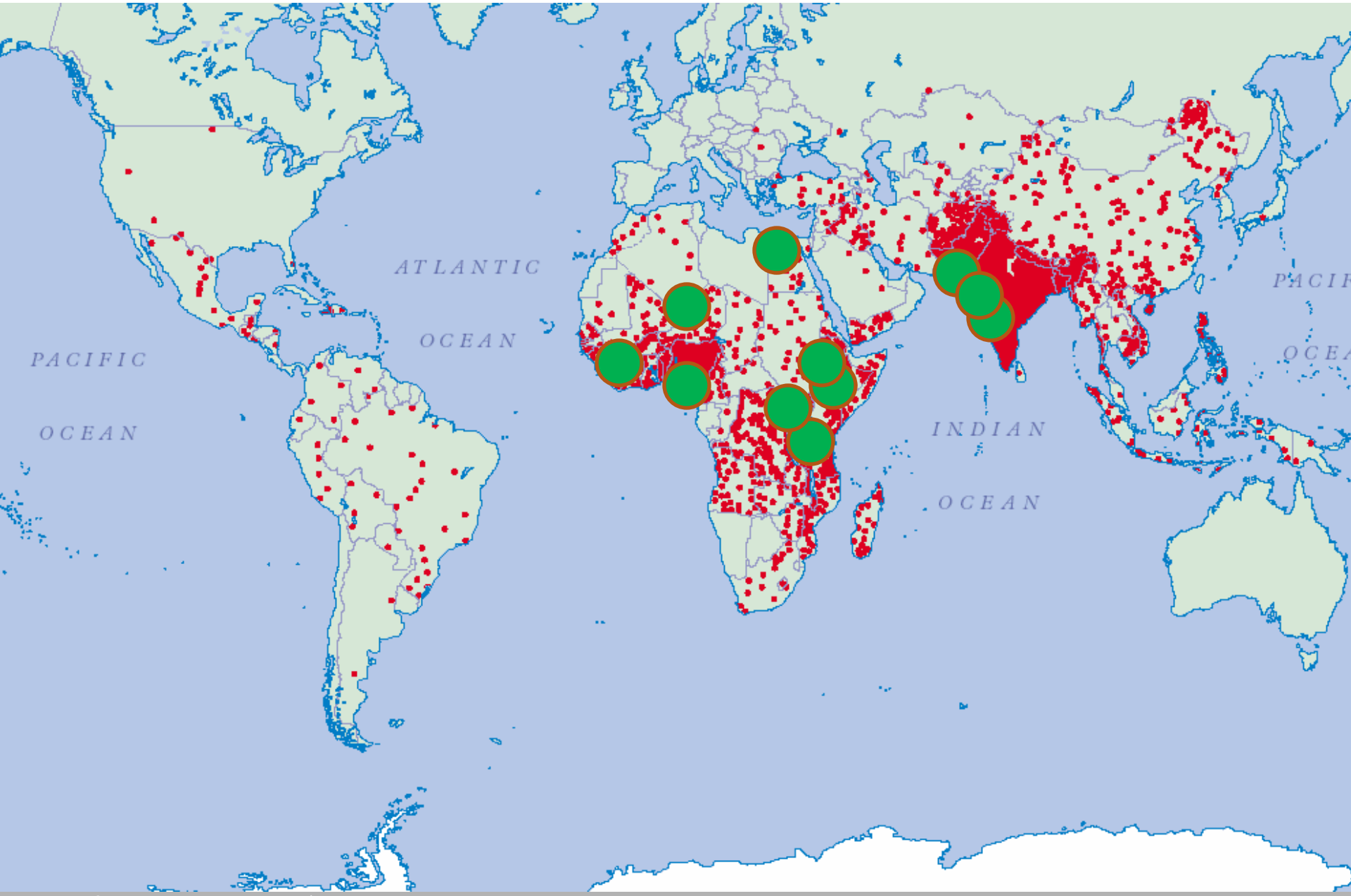

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Image by MIT OpenCourseWare.

Pilot Study - *Objectives*

1.Measure healthcare worker performance: effective delivery of essential standards of care proven to result in improved maternal, fetal, and neonatal health outcomes

2.Obtain qualitative feedback describing contextual factors that facilitate or block successful checklist implementation

3.Measure trends in mortality and major morbidity rates after checklist implementation

Pilot Study - Design

Pre-Intervention
~3 months
300 Patients

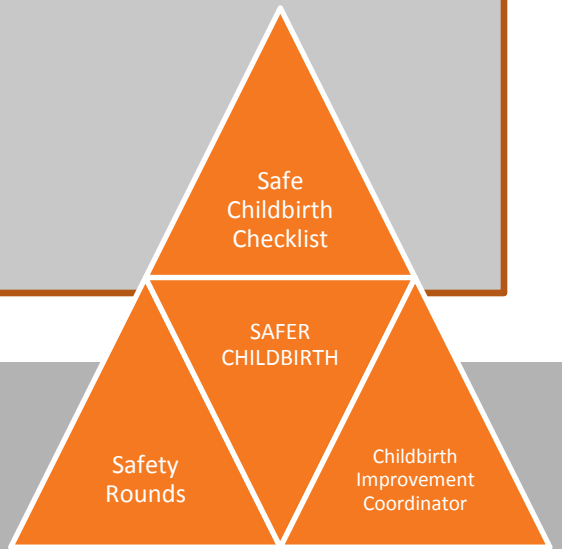
Intervention
1 week

Checklist Training and Implementation

Post-Intervention
~3 months
300 Patients

Childbirth Improvement Coordinator meets with childbirth staff

1. Stories shared
2. Some baseline data shared
3. Checklist content modified to fit local practice
4. Instructional video and simulation practice
5. Supervised practice, feedback, ongoing support



Results

- ALL of the 29 essential standards of care were delivered more reliably
- Overall effective delivery of a core set of standards improved by over 50%
- *System changes catalyzed by introduction of checklist*
- *Job satisfaction and patient satisfaction increased*
- *Better teamwork and communication*

Next steps

- RCT
- Implementation
- Use of technology?

Thank-you!

Questions?

HST.S14 Health Information Systems to Improve Quality of Care in Resource-Poor Settings
Spring 2012