



Cost-effectiveness model

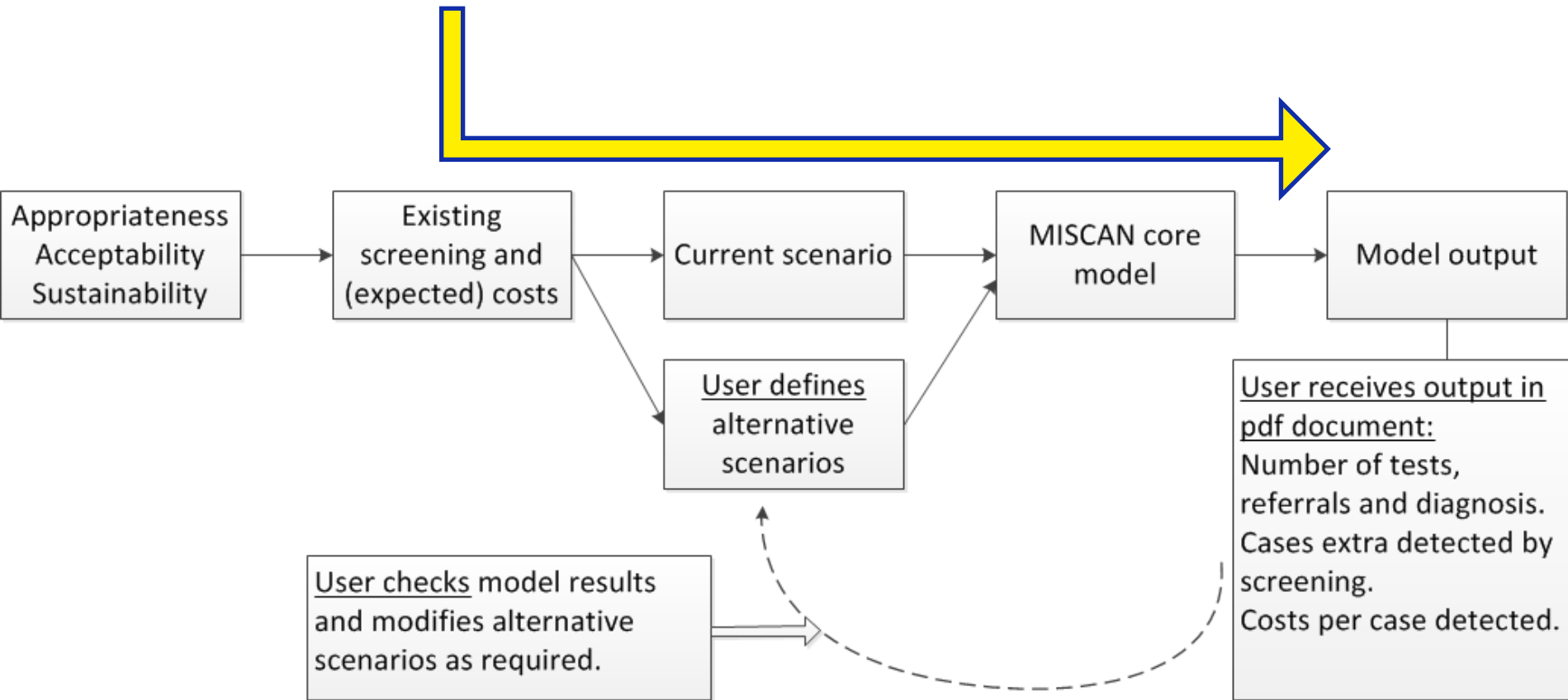
Examples of countries with too much or too little screening

EAM Heijnsdijk, ML Verkleij, HJ de Koning

Neonatal hearing screening and child vision screening

- Most high income countries have vision/hearing screening implemented
 - But is a current programme giving most value for money?
- Some middle income countries have vision/hearing screening in place
 - How can we improve feasibility?
- Some middle income countries consider vision/hearing screening implementation:
 - Where and how to start?

EUSCREEN Webtool model overview



High Income Country – Vision Screening

- Population-based child vision screening programme
- Visual Acuity measurements age 3, 4 and 5 years.
- High attendance rates
- High referral / failure rates age 3
- Too much screening?

High Income Country – Vision Screening Scenario Overview

Current programme:

Age	Location	Professional	Attendance	Referral
3	Child health center	Nurse	75%	15%
4	Child health center	Nurse	70%	10%
5	Child health center	Nurse	80%	10%

Alternative programmes:

Scenario	Age of screening
1	4 and 5 years
2	3 and 5 years

High Income Country – Vision Screening Results per 10,000 children

	Current	Scenario 1	Scenario 2
	<i>Age 3, 4, 5</i>	<i>Age 4, 5</i>	<i>Age 3, 5</i>
Tests	22200	14787	15323
Referrals	2592	1479	1904
Detected by screening	130	115	99
Persistent amblyopia prevented	59	56	46
Number of screens /persistent amblyopia prevented	375	263	335

High Income Country – Hearing Screening


- Population-based neonatal screening programme
- 3-stage screening process: OAE – OAE – aABR
- High attendance rates at maternity ward, lower for follow-up rounds
- Too much screening?

High Income Country – Hearing Screening Scenario Overview


Current programme (well babies)

Age	Test device	Attendance	Referral
Day 2	OAE	95%	9%
Day 10	OAE	80%	30%
Day 30	aABR	80%	80%

Alternative scenarios



Age	Test device	Attendance	Referral
Day 2	OAE	95%	9%
Day 10	OAE	80%	30%



Age	Test device	Attendance	Referral
Day 2	OAE	95%	9%
Day 2	aABR	95%	40%

High income country – Hearing Screening Results per 10,000 children

	Current	Scenario 1	Scenario 2
	O-O-A	O-O	O-A (day2)
Total number of OAE tests	10184	10184	9500
Total number of aABR tests	164	0	812
Number of referrals	131	205	325
Number of >40dB detected by screening	8.9	11.3	13.8

Middle income country – Vision Screening

- Visual acuity measurement by school nurse at age 6
- Too late for effective treatment of amblyopia?
- Upscaling the programme to multiple screens
- Combining vision screening with existing contact moments in preventive child health care?

Middle income country – Vision Screening Scenario Overview

Current vision screening programme:

Age	Location	Professional	Attendance	Referral
6	Primary School	Nurse	75%	10%

Current general preventive child health care programme:

Age	Purpose	Location	Professional	Attendance
4	Vaccination	Child health center	Nurse	95%
5	General examination	Child health center	Nurse	70%

Upscaling, while combining with existing programme?

Scenario	Age of screening
1	4 and 6 years
2	5 and 6 years

Middle income country – Vision Screening Results per 10,000 children

	Current	Scenario 1	Scenario 2
	<i>Age 6</i>	<i>Age 4, 6</i>	<i>Age 5, 6</i>
Tests	7351	16661	14183
Referrals	735	1666	1418
Detected by screening	82	133	128
Persistent amblyopia prevented	49	69	71
Number of screens /persistent amblyopia prevented	151	240	199

Middle Income Country – No Hearing screening

- Rural area: Long travel distances
- 99% of children born in hospital.
- Average stay after birth is 3 days.
- Traditionally high attendance rates for vaccination programme
- Where and how to start?

Middle Income Country – No Hearing screening

Age	Purpose	Location	Professional	Attendance
0 – 3 days	Birth	Maternity clinic	Nurse / Midwife	99%
4 weeks	General examination	Child health center	Pediatrician	80%
6 weeks	Vaccination	Child health center	Nurse	95%

Proposed hearing screening scenarios

Age	Test device	Attendance	Referral
Day 2	OAE	99%	9%
Day 3	aABR	99%	30%

Age	Test device	Attendance	Referral
Day 2	OAE	99%	9%
4 weeks	aABR	80%	20%

Middle Income Country – No Hearing screening

Results per 10,000 children

	Scenario 1	Scenario 2
	<i>Both rounds: Maternity clinic</i>	<i>Round 2: 4 weeks</i>
Total number of OAE tests	9900	9900
Total number of aABR tests	8821	7128
Number of referrals	265	143
Number of >40dB detected by screening	15.6	12.5

Challenges differ between countries (1)

- High income countries
 - Omitting a screen is difficult.

- Middle income countries
 - Feasibility
 - Increase uptake
 - Urban / rural differences
 - Equity, inclusion of minorities
 - Treatment adherence

Challenges in Low income countries

- Attendance rates
 - Travel duration
 - General child health care accessibility
 - Trust in health care system
 - Cultural beliefs
- Supply system
- Treatment availability
- Treatment accessibility
 - Distance
 - Out-of-pocket payments

Discussion

- First version of the Webtool

- Differences in the underlying model between countries:
Often expected, but empirical evidence is lacking.
 - Prevalence
 - Quality of life
 - Clinical detection age without screening

- High quality data collection is essential