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Scaling up safe surgery for district and rural populations in Africa

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for the SURG-Africa team

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This presentation

What we do

- generate evidence on how to deliver essential safe surgery through district level hospitals

How we work

- collaboratively with national surgical societies and governments

What we show

- scale-up of safe surgery for rural populations in Africa is feasible through district surgical teams supervised by specialist surgeons

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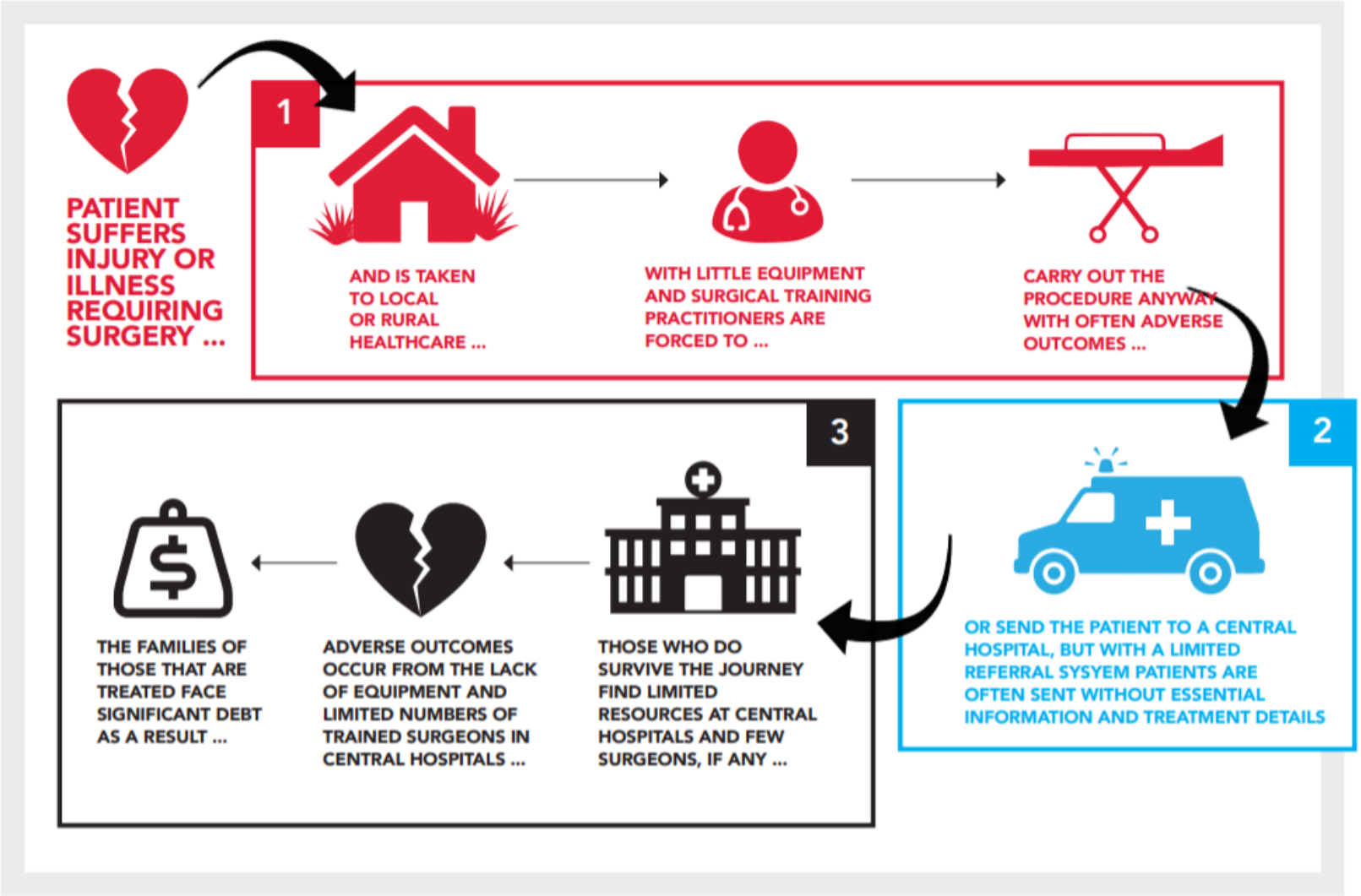
The need:



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The Need:

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- 63% of population in SSA lives in rural areas, where district level hospitals are the main providers of healthcare services.
- There are just 1,690 surgeons for a combined population of 320 million, this equates to 0.5 per 100,000 people, 26 times less than in Ireland.
- District level surgery is provided by non-specialists: mainly non-physician clinicians (NPCs) and medical doctors with no formal training in surgery.
- They need *training, supervision and professional development* for multiple reasons, including to ensure quality of care and retention.

The response: our work

COST-Africa 2011-2016 (Clinical Officer Surgical Training – Africa)

AIM:

To demonstrate the effectiveness, cost-effectiveness, safety and feasibility of a model of training & supervision of non-physician clinicians (CO/ML), so as to make safe surgery available at district level hospitals in **Malawi** and **Zambia**.

SURG-Africa 2017-2020 (Scaling up Safe Surgery for District and Rural Populations in Africa)

AIM:

To make emergency and basic elective surgery available to rural populations through district level hospitals in **Tanzania**, Malawi and Zambia though developing and evaluating country specific models whereby surgeon specialists are supervisors and mentors of **all surgically active district level clinicians**

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Logic of our intervention studies

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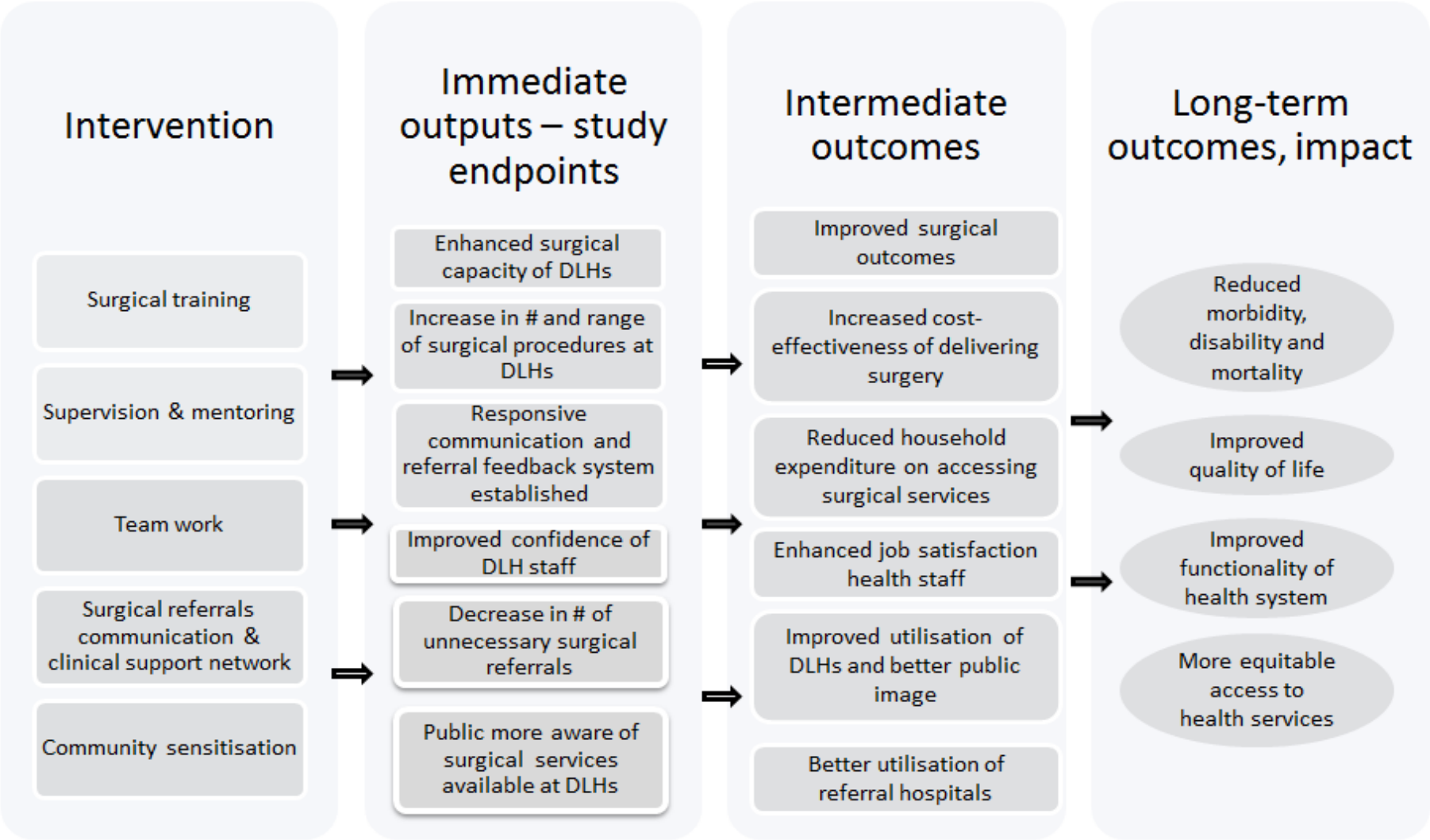

Surgical training and supervision

COST-Africa (2011-2016)

- Aim: to respond to surgical workforce crisis in Malawi and Zambia through development of sustainable training and supervision systems for existing district level surgical clinicians.

- Established formal training programmes for non-physician clinicians
- Enabled surgical specialists to become mentors / supervisors of district surgery

Training clinical officers in Malawi

- New BSc in Surgery accredited through University of Malawi
- Blended training
  - 12-months central training of 17 Clinical Officers (COs) at the College of Medicine in Blantyre
  - 24-months of in-service training at district hospitals (2 COs at each of 8 intervention hospitals) receiving 2-weekly visits by surgeon trainers from Blantyre and Lilongwe
- Effects of the training were evaluated through a randomised controlled trial (RCT) in 16 district hospitals (8 intervention + 8 control)
- 2 further cadres of BSc students since enrolled, funded locally

COST-Africa findings in Malawi

Table 2. Change in crude numbers of index procedures done in intervention and control groups by year

	Change	
	Intervention	Control
2013–2014	572 to 750 (+31)	802 to 686 (–14)
2014–2015	750 to 993 (+32)	686 to 766 (+12)
Overall (2013–2015)	572 to 993 (+74)	802 to 766 (–4)

Values in parentheses are percentages.

Gajewski at al. British Journal of Surgery, 2019 – see here

COST-Africa findings (2)

Table 6. Wound infection rates after hernia operation by cadre

	Wound infection	
	No	Yes
CA-CO	511 (97·7)	12 (2·3)
MD	33 (92)	3 (8)

Values in parentheses are percentages. Data are based on 559 hernia operations across all intervention hospitals. CA-CO, COST-Africa clinical officer; MD, medical doctor. P = 0·065 (Fisher's exact test).

Gajewski at al. British Journal of Surgery, 2019 – see here

COST-Africa findings (3)

Overall there was no significant difference in the good outcome of hernia repair surgery (defined here as no severe symptoms and up to three mild symptoms) between CHs and DHs ($p = 0.260$) (Table 2).

Table 2
Elective and emergency hernia repair cases in central and district hospitals

Hospital type	Good outcome	No good outcome
District ($n = 50$)	37 (74%)	13 (26%)
Central ($n = 48$)	40 (83.3%)	8 (16.6%)

$p = 0.260$

Gajewski at al. World Journal of Surgery, 2018 – see here

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Enhancing surgical skills and practice of NPCs in Zambia

In Zambia, COST-Africa aligned with and built on the existing national Medical Licentiate (ML) advanced clinical officer training programme by:

- National surgical specialists in Lusaka provided additional 3-month advanced surgical skills training to MLs, prior to their deployment to district hospitals

  and
- 24 months of supervision by specialists surgeons who spent 1-3 days visiting trained MLs based at 9 district hospitals across 9 provinces (excl Lusaka and Copperbelt)

COST-Africa findings Zambia

Benefits of surgical task shifting

All participants, especially hospital managers and MOs, reported that MLs were highly valued and essential to the delivery of surgery at the district level. MLs took much of the burden of work from other cadres, particularly MOs, because they were clinically trained and surgical and medical duties could therefore be delegated to them:

> This year, 200+ cases have been done which is commendable with the coming of the ML in comparison with what was done the previous year – which was about 110 for the whole year. (MO 10)Especially the laparotomies, intestinal obstruction or anything else to do with the abdomen, we would do them here when he was around (MO 8)

Capacity building at the district level

MLs also played an important role in informal on-the-job surgical training of medical officers and other clinicians such as clinical officers at district-level hospitals. This included assisting newly trained and newly deployed MOs in gaining experience in surgery; and imparting new surgical skills to, and enhancing the scope of surgical practice of, well-established district-level MOs.

> Even me when I came here, I wasn't so conversant with the caesarean sections and other small procedures, but I would always ask that he [ML] shows me how to carry out certain procedures. (MO 8).

Gajewski at al. Human resources for Health, 2017 – see here

See also here for obstacles to scale up in Malawi

Benefits of the supervision model

Maamba DH, Zambia: approximate cost of referral

Ambulance driver:	USD 55
Accompanying nurse:	USD 70
Fuel: 120 litres*8.59:	USD 103 (Maamba GH to Livingstone CH)

Cost per referral =	USD 228.
Cost of one supervision visit =	USD 316

If two unnecessary referrals are prevented through in-service training provided by visiting supervising surgeons the model starts to provide cost savings to the country's health system

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Cost of surgery at District vs Central level

Findings from COST-Africa (Zambia):

	Maamba DH (US$)	Livingstone GH (US$)	Cost saving (US$)	% diff
C section	1,142	1,842	700	61%
Evacuation of uterus	503	774	271	54%
Hernia repair	1,247	1,842	595	48%

Findings from SURG-Africa: all of the surveyed facilities reported under-utilised surgical capacity

Bijlmakers at al. Health Policy and Planning, 2018 – see here see also Cheelo et al. here

Training existing district surgical teams

SURG-Africa (2017-2020)

- Aim: to improve access to and quality of surgical, obstetric, anaesthesia and nursing care in Malawi, Zambia and Tanzania.

- Intervention model:
  - Supervisory teams regularly visit district hospitals to train, supervise and mentor district surgical teams
  - Remote consultations are enabled, which provide district level surgical providers with real-time access to specialists

Benefits of the model in Zambia

For the perspectives of Zambian policy / decision makers, specialist surgeons, and non-physician clinicians

Listen here

SURG-Africa Objectives

Strengthen individual and team surgical skills through:

- Improving referral practices
- Establishing effective consultation and support networks based on mobile phone technology (WhatsApp groups)
- Improving data collection
- Testing the models – supporting, but also effecting national scale up and transferability of results internationally

Objectives – skills

MALAWI

# staff able to do:	Balaka	Chikwawa	Chiradzulu	Machinga	Mangochi	Mulanje	Mwanza	Nsanje	Thyolo
C/S	17	15	15	25	26	10	10	9	31
Elective hernia	3	7	5	4	6	4	2	7	3
Total Hysterectomy	9	7	3	4	6	3	2	3	3
Laparotomy	14	7	3	13	6	6	3	3	4

TANZANIA

# staff able to do:	Meru	Longido HC	Oltrument	MMOC HC	Hai	Huruma	Kilema	Same	Siha	Usangi
C/S	24	5	6	1	8	8	7	2	6	5
Elective Hernia	3	2	1	1	2	2	7	1	2	2
Hysterectomy	1	2	1	0	0	3	4	1	0	0
Laparotomy	2	2	1	0	2	3	4	1	2	3

To learn what simple routine data systems can show – see [here]

Printing and sending these registers to all government hospitals (27)in Malawi amounted to the total of 2,500 EURO

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Knowledge generation

Study design

- Mixed-methods controlled trial to evaluate the intervention in Malawi, Zambia and Tanzania

Planned research outputs: 2019-21

- Surgical capacity assessment (based on a situation analysis in 85 district hospitals)
- Anaesthesia capacity assessment repeated analysis – *baseline 2nd revision submitted*
- Paediatric surgical care capacity
- Longitudinal study on surgical productivity and its predictors
- Referral patterns
- Range of costing and cost-effectiveness studies
- Range of quality improvement focused studies
- Community burden of surgical disease study?

Objectives – referrals

To hear about the WhatsApp clinical network in Malawi

Listen here

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Funded by the European Union

Thank you

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