

Supplementary table 1: Initial email based survey

# Survey: Anaesthesia providers' training in sub-Saharan Africa

We are inviting you to take part in a research study survey being done by Dr. Fred Bulamba at Busitema University (Mbale, Uganda), Dr. Michael Lipnick at the University of California, San Francisco and Dr. Hilary Edgcombe at King's College London. Participating in this survey is optional.

The survey will help us learn more about different practice models for anesthesia training delivery in low- and middle-income countries (LMICs), focusing on non-physician anaesthesia providers. We are inviting participants who provide or have personal knowledge of anesthesia or surgery care in LMICs, and we have contacted you through word of mouth or national societies.

The survey will take about 15 minutes to complete, you can stop it at any time and the survey results will be anonymous. Please do not include your name or other information that could be used to identify you in the survey responses.

Questions? Please contact Fred Bulamba at [fredflybulamba@gmail.com](mailto:fredflybulamba@gmail.com), Michael Lipnick at [michael.lipnick@ucsf.edu](mailto:michael.lipnick@ucsf.edu) or Hilary Edgcombe at [hilary.edgcombe@nda.ox.ac.uk](mailto:hilary.edgcombe@nda.ox.ac.uk). If you have questions or concerns about your rights as a research participant, you can call the UCSF Institutional Review Board at 415-476-1814 or any of the institutions named in the participant information sheets (for a link to these, please see your original email invitation to participate).

If you are willing to participate in this study, please continue.

**For the purpose of this survey, we use the term "physician anaesthesiologists" to mean a graduate of a medical school who has undergone a period of postgraduate training in a dedicated anaesthesia education program. (This DOES NOT include graduates of medical school who provide anaesthesia but have not graduated from a formal anaesthesia training program).**

**We use the term "non-physician anaesthesia provider" to collectively describe all non-physician providers with a varied background who have undergone dedicated clinical anaesthesia training. (This DOES NOT include healthcare providers who give anaesthesia but have not graduated from a formal anaesthesia training program).**

**The survey will ask you about numbers of training programs, locations, prerequisites, number of providers in country and number of graduates from programs. It is OK to approximate your answers, though if you are able to access more exact numbers please do so.**

**First of all, we would like to know a little about your background and role.**

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What is your country of permanent residence?

(response required)

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Which of the following best describes your primary professional role?

(response required)

- ☐ Physician anaesthesiologist
  - ☐ Non-physician anaesthesia provider
  - ☐ Physician surgeon
  - ☐ Non-physician surgeon
  - ☐ Other
- 

Please state your job title/professional role:

Please select the country in Africa that you know the best with regard to non-physician anaesthesia training and practice models:

(response required)

- ☐ Algeria
- ☐ Angola
- ☐ Benin
- ☐ Botswana
- ☐ Burkina Faso
- ☐ Burundi
- ☐ Cabo Verde
- ☐ Cameroon
- ☐ Central African Republic
- ☐ Chad
- ☐ Comoros
- ☐ Democratic Republic of the Congo
- ☐ Republic of the Congo
- ☐ Cote d'Ivoire
- ☐ Djibouti
- ☐ Egypt
- ☐ Equatorial Guinea
- ☐ Eritrea
- ☐ Ethiopia
- ☐ Gabon
- ☐ Gambia
- ☐ Ghana
- ☐ Guinea
- ☐ Guinea-Bissau
- ☐ Kenya
- ☐ Lesotho
- ☐ Liberia
- ☐ Libya
- ☐ Madagascar
- ☐ Malawi
- ☐ Mali
- ☐ Mauritius
- ☐ Morocco
- ☐ Mozambique
- ☐ Namibia
- ☐ Niger
- ☐ Nigeria
- ☐ Rwanda
- ☐ Sao Tome and Principe
- ☐ Senegal
- ☐ Seychelles
- ☐ Sierra Leone
- ☐ Somalia
- ☐ South Africa
- ☐ South Sudan
- ☐ Sudan
- ☐ Swaziland
- ☐ Tanzania
- ☐ Togo
- ☐ Tunisia
- ☐ Uganda
- ☐ Zambia
- ☐ Zimbabwe
- ☐ Other
- ☐ Papua New Guinea
- ☐ Nepal
- ☐ East Timor
- ☐ Mongolia

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How do you have knowledge of non-physician anaesthesia training and/or practice in [africa\_country1]?

- ☐ I live and work full-time as a healthcare provider in [africa\_country1]
  - ☐ I have visited [africa\_country1] to provide care/training or as a researcher
  - ☐ I have never been to [africa\_country1] but have friends/colleagues there
  - ☐ Other
- ((Please select all that apply))
- 

Please clarify.

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**This section is about the overall provision of anaesthesia care in [africa\_country1], firstly considering the role of PHYSICIAN anaesthesiologists:**

In [africa\_country1], roughly what percentage of the total number of anaesthetics are given by physician anaesthesiologists (including both national and expatriate providers)?

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Please complete this even if you are uncertain of the answer.

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How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

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What is your best estimate for the number of physician anaesthesiologists currently working in [africa\_country1]?

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How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

---

Roughly what proportion of the physician anaesthesiologists working in [africa\_country1] are expatriate, ie. permanent residents of a different country?

- ☐ None are expatriate  
☐ A few are expatriate (under 25%)  
☐ Some are expatriate (25-50%)  
☐ Most are expatriate (50-75%)  
☐ Almost all are expatriate (>75%)  
☐ I wish to comment on this

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Please comment

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How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

**Now considering the role of NON-PHYSICIAN anaesthesia providers:**

In [africa\_country1], roughly what percentage of the total number of anaesthetics are given by non-physician anaesthesia providers who have completed a formal anaesthesia training program?

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Please complete this even if you are uncertain of the answer.

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How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

---

What is your best estimate for the number of non-physician anaesthesia providers who have completed a formal anaesthesia training program and currently work in [africa\_country1]?

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How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

Is there a national anaesthesia professional society in [africa country1]?

- ☐ Yes  
☐ No  
☐ I do not know

☐ Yes  
☐ No  
☐ I do not know  
 ((For example, the Ministry of Health, or a General Health Professions Council or similar))



**Considering PHYSICIAN anaesthesiologists' training in [africa\_country1]:**

To the best of your knowledge, how many physician anaesthesiologist training programs currently exist in [africa\_country1]?

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After training, is there opportunity for CPD (continuing professional development, also known as CME, continuing medical education) for physician anaesthesiologists in [africa\_country1]?

- ☐ Yes, and enough to meet the needs
  - ☐ Yes, but not enough to meet the needs
  - ☐ No, there is none
  - ☐ I do not know
  - ☐ I wish to comment further on this
- 

Please comment

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**Considering NON-PHYSICIAN anaesthesia providers' training in [africa\_country1]:**

To the best of your knowledge, how many non-physician anaesthesia provider training programs currently exist in [africa\_country1]?

---

After training, is there opportunity for CPD (continuing professional development, also known as CME, continuing medical education) for non-physician anaesthesia providers in [africa\_country1]?

- ☐ Yes, and enough to meet the needs  
☐ Yes, but not enough to meet the needs  
☐ No, there is none  
☐ I do not know  
☐ I wish to comment further on this

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Please comment

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In [africa\_country1], what is the title of the most common non-physician anaesthesia providers? (For example, 'Anaesthetic Officer', 'Nurse Anaesthetist', 'Anaesthesia tech', etc)

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Do these providers ([africa\_np\_1]s) undergo a formal training program dedicated to anaesthesia?

- ☐ Yes  
☐ No  
☐ I do not know

(response required)

**The following questions are about [africa\_np\_1]'s training in [africa\_country1].**

What is the name of the certification or degree awarded to these graduates?

- ☐ I don't know  
☐ Certificate  
☐ Bachelors degree  
☐ Diploma  
☐ Masters  
☐ Other

(For example: "Diploma in anaesthesia", "Bachelors," "Masters," or "Certificate" etc)

Please enter the name here.

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How many [africa\_np\_1] training programs are there in [africa\_country1]?

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Please provide the names of the programs and the town in which they are located (For example: Anaesthetic Officer School Kampala, Anaesthetic Officer School Gulu)

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Approximately how many new [africa\_np\_1]s graduate each year in [africa\_country1]? (From all programs combined)

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**If there is more than one [africa\_np\_1] training program in [africa\_country1], please answer these questions for the specific program you know the best.**

Which program are you describing? (please give the name and/or location)

\_\_\_\_\_

What is the duration of the training program in number of months?

\_\_\_\_\_  
((months))

What are the requirements/qualifications for trainees to be eligible to enroll in this training program? (May select more than one answer)

- ☐ Nursing degree
- ☐ Nursing diploma
- ☐ Secondary school
- ☐ Medical school degree
- ☐ Other

What are the other requirements/qualifications for trainees to be eligible to enroll in this training program?

\_\_\_\_\_

How much of the curriculum is taught by physician anaesthesiologists?

Please complete this even if you are uncertain of the answer.

- ☐ None
- ☐ Very little
- ☐ Some
- ☐ Most
- ☐ Almost all
- ☐ All
- ☐ I wish to comment further on this

Please comment

\_\_\_\_\_

How confident are you in this answer?

- ☐ Not at all confident
- ☐ Fairly confident
- ☐ Very confident

Do foreign/visiting faculty teach in the program?

- ☐ Yes
- ☐ No
- ☐ I do not know  
(Including both physician and non-physician faculty teachers)

What foreign organisations, institutions or funding agencies, if any, are formally supporting the program? (Please state 'none' or 'I don't know' if applicable).

\_\_\_\_\_

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Please select which sub-specialty areas are taught during the program:

- ☐ Trauma management
- ☐ Obstetric anaesthesia
- ☐ Paediatric anaesthesia
- ☐ Cardiac anaesthesia
- ☐ Regional anaesthesia
- ☐ Neuroanaesthesia
- ☐ Critical care
- ☐ Information technology skills
- ☐ Teaching skills
- ☐ Management skills
- ☐ Ethics
- ☐ Law
- ☐ Other
- ☐ I am not sure

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Please identify any other subspecialty areas covered in this training program.

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Please select which methods of teaching/learning are used by the program:

- ☐ Lectures in classroom
- ☐ In-theatre supervision/instruction
- ☐ Simulation scenarios on mannequins
- ☐ Skills workshops in a classroom
- ☐ Online materials
- ☐ Workplace assessments
- ☐ Other
- ☐ I am not sure

---

Please identify any other teaching/learning methods used in this program.

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**For non-physician anaesthesia providers graduating from this program, please select the answer that best describes their training and practice for each of the following tasks:**

	Yes, trained to perform independently	Trained to perform, but only with supervision	Not trained to perform	I'm not sure
Patient preoperative assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checking anaesthesia equipment prior to case	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparing medications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of venous cannulas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering medications (including narcotics)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering fluids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering blood products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of the surgical safety checklist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inducing general anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing spinal anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing epidural anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Airway management including intubation and LMA placement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional anaesthesia (peripheral nerve blocks, other than spinals)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining general anaesthesia with volatiles (ether, halothane, isoflurane, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining anaesthesia with ketamine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of arterial cannulas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of central venous access (internal jugular, femoral, subclavian)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video laryngoscopy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fiberoptic intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emergence from general anaesthesia including extubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing mechanical ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teaching anaesthesia trainees in theatre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicating directly with patients' families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Do you have knowledge of another non-physician anaesthesia provider training program in [africa\_country1] or elsewhere in Africa?

- ☐ Yes, in [africa\_country1]  
☐ Yes, in another African country  
☐ No

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What is the title of the providers trained in this program? (For example, 'Anaesthetic Officer', 'Nurse Anaesthetist', 'Anaesthesia tech', etc)

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**The following questions are about [africa\_np\_3]'s training in [africa\_country1].**

What is the name of the certification or degree awarded to these graduates?

- ☐ I don't know  
☐ Certificate  
☐ Bachelors degree  
☐ Diploma  
☐ Masters  
☐ Other

(For example: "Diploma in anaesthesia", "Bachelors," "Masters," or "Certificate" etc)

Please enter the name here.

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How many [africa\_np\_3] training programs are there in [africa\_country1]?

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Please provide the names of the programs and the town in which they are located (For example: Anaesthetic Officer School Kampala, Anaesthetic Officer School Gulu)

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Approximately how many new [africa\_np\_3]s graduate each year in [africa\_country1]? (From all programs combined)

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**If there is more than one [africa\_np\_3] training program in [africa\_country1], please answer these questions for the specific program you know the best.**

Which program are you describing? (please give the name and/or location)

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What is the duration of the training program in number of months?

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((months))

What are the requirements/qualifications for trainees to be eligible to enroll in this training program? (Select all that apply)

- ☐ Nursing degree
- ☐ Nursing diploma
- ☐ Secondary school
- ☐ Medical school degree
- ☐ Other

What are the other requirements/qualifications for trainees to be eligible to enroll in this training program?

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How much of the curriculum is taught by physician anaesthesiologists?

Please complete this even if you are uncertain of the answer.

- ☐ None
- ☐ Very little
- ☐ Some
- ☐ Most
- ☐ Almost all
- ☐ All
- ☐ I wish to comment further on this

Please comment

---

How confident are you in this answer?

- ☐ Not at all confident
- ☐ Fairly confident
- ☐ Very confident

Do foreign/visiting faculty teach in the program?

- ☐ Yes
- ☐ No
- ☐ I do not know  
(Including both physician and non-physician faculty teachers)

What foreign organisations, institutions or funding agencies, if any, are formally supporting the program?

---

(Please state 'none' or 'I don't know' if applicable).

---

Please select any sub-specialty areas that are taught during the program:

- ☐ Trauma management
- ☐ Obstetric anaesthesia
- ☐ Paediatric anaesthesia
- ☐ Cardiac anaesthesia
- ☐ Regional anaesthesia
- ☐ Neuroanaesthesia
- ☐ Critical care
- ☐ Information technology skills
- ☐ Teaching skills
- ☐ Management skills
- ☐ Ethics
- ☐ Law
- ☐ Other
- ☐ I am not sure

---

Please identify any other subspecialty areas covered in this training program.

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---

Please select which methods of teaching/learning are used by the program:

- ☐ Lectures in classroom
- ☐ In-theatre supervision/instruction
- ☐ Simulation scenarios on mannequins
- ☐ Skills workshops in a classroom
- ☐ Online materials
- ☐ Workplace assessments
- ☐ Other
- ☐ I am not sure

---

Please identify any other teaching/learning methods used in this program.

---

**For non-physician anaesthesia providers graduating from this program, please select the answer that best describes their training and practice for each of the following tasks:**

	Yes, trained to perform independently	Trained to perform, but only with supervision	Not trained to perform	I'm not sure
Patient preoperative assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checking anaesthesia equipment prior to case	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparing medications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of venous cannulas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering medications (including narcotics)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering fluids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering blood products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of the surgical safety checklist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inducing general anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing spinal anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing epidural anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Airway management including intubation and LMA placement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional anaesthesia (peripheral nerve blocks, other than spinals)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining general anaesthesia with volatiles (ether, halothane, isoflurane, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining anaesthesia with ketamine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of arterial cannulas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of central venous access (internal jugular, femoral, subclavian)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video laryngoscopy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fiberoptic intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emergence from general anaesthesia including extubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing mechanical ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teaching anaesthesia trainees in theatre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicating directly with patients' families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In which country is this program?

- ☐ Algeria
- ☐ Angola
- ☐ Benin
- ☐ Botswana
- ☐ Burkina Faso
- ☐ Burundi
- ☐ Cabo Verde
- ☐ Cameroon
- ☐ Central African Republic
- ☐ Chad
- ☐ Comoros
- ☐ Democratic Republic of the Congo
- ☐ Republic of the Congo
- ☐ Cote d'Ivoire
- ☐ Djibouti
- ☐ Egypt
- ☐ Equatorial Guinea
- ☐ Eritrea
- ☐ Ethiopia
- ☐ Gabon
- ☐ Gambia
- ☐ Ghana
- ☐ Guinea
- ☐ Guinea-Bissau
- ☐ Kenya
- ☐ Lesotho
- ☐ Liberia
- ☐ Libya
- ☐ Madagascar
- ☐ Malawi
- ☐ Mali
- ☐ Mauritius
- ☐ Morocco
- ☐ Mozambique
- ☐ Namibia
- ☐ Niger
- ☐ Nigeria
- ☐ Rwanda
- ☐ Sao Tome and Principe
- ☐ Senegal
- ☐ Seychelles
- ☐ Sierra Leone
- ☐ Somalia
- ☐ South Africa
- ☐ South Sudan
- ☐ Sudan
- ☐ Swaziland
- ☐ Tanzania
- ☐ Togo
- ☐ Tunisia
- ☐ Uganda
- ☐ Zambia
- ☐ Zimbabwe
- ☐ Other

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How do you have knowledge of non-physician anaesthesia provider training and/or practice in [africa\_country2]?

- ☐ I live and work full-time as a healthcare provider in [africa\_country2]
  - ☐ I have visited [africa\_country2] to provide care/training or as a researcher
  - ☐ I have never been to [africa\_country2] but have friends/colleagues there
  - ☐ Other
- ((Please select all that apply))

---

Please clarify.

---

**This following section of questions is about the overall provision of anaesthesia care in [africa\_country2], firstly considering the role of PHYSICIAN anaesthesiologists:**

In [africa\_country2], roughly what percentage of the total number of anaesthetics are given by physician anaesthesiologists (including both national and expatriate providers)?

---

Please complete this even if you are uncertain of the answer.

How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

What is your best estimate for the number of physician anaesthesiologists currently working in [africa\_country2]?

---

How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

Roughly what proportion of the physician anaesthesiologists working in [africa\_country2] are expatriate, ie. permanent residents of a different country?

- ☐ None are expatriate  
☐ A few are expatriate (under 25%)  
☐ Some are expatriate (25-50%)  
☐ Most are expatriate (50-75%)  
☐ Almost all are expatriate (>75%)  
☐ I wish to comment on this

Please comment

---

How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

**Now considering the role of NON-PHYSICIAN anaesthesia providers:**

In [africa\_country2], roughly what percentage of the total number of anaesthetics are given by non-physician anaesthesia providers who have completed a formal anaesthesia training program?

---

Please complete this even if you are uncertain of the answer.

---

How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

---

What is your best estimate for the number of non-physician anaesthesia providers who have completed a formal anaesthesia training program and currently work in [africa\_country2]?

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How confident are you in this answer?

- ☐ Not at all confident  
☐ Fairly confident  
☐ Very confident

**Accreditation and support for anaesthesia professionals in [africa\_country\_2]:**

Is there a national anaesthesia professional society  
in [africa\_country2]?

- ☐ Yes  
☐ No  
☐ I do not know

Is there a national accrediting or certification body/bodies for anaesthesia training in [africa\_country2]?  
((For example, the Ministry of Health, or a General Health Professions Council or similar))

- ☐ Yes  
☐ No  
☐ I do not know

Please enter the name of the accrediting body

\_\_\_\_\_



**Considering PHYSICIAN anaesthesiologists' training in [africa\_country2]:**

To the best of your knowledge, how many physician anaesthesiologist training programs currently exist in [africa\_country2]?

---

After training, is there any opportunity for CPD (continuing professional development, also known as CME, continuing medical education) for physician anaesthesiologists in [africa\_country2]?

- ☐ Yes, and enough to meet the needs
  - ☐ Yes, but not enough to meet the needs
  - ☐ No, there is none
  - ☐ I do not know
  - ☐ I wish to comment further on this
- 

Please comment

---

**Considering NON-PHYSICIAN anaesthesia providers' training in [africa\_country2]:**

To the best of your knowledge, how many non-physician anaesthesia provider training programs currently exist in [africa\_country2]?

---

After training, is there any opportunity for CPD (continuing professional development, also known as CME, continuing medical education) for non-physician anaesthesia providers in [africa\_country2]?

- ☐ Yes, and enough to meet the needs  
☐ Yes, but not enough to meet the needs  
☐ No, there is none  
☐ I do not know  
☐ I wish to comment further on this

Please comment

---

In [africa\_country2], what is the title of the most common non-physician anaesthesia provider? (For example, 'Anaesthetic Officer', 'Nurse Anaesthetist', 'Anaesthesia tech', etc)

---

Do these providers ([africa\_np\_2]s) undergo a formal training program dedicated to anaesthesia?

- ☐ Yes  
☐ No  
☐ I do not know

(response required)

**The following questions are about [africa\_np\_2]'s training in [africa\_country2].**

What is the name of the certification or degree awarded to these graduates?

- ☐ I don't know  
☐ Certificate  
☐ Bachelors degree  
☐ Diploma  
☐ Masters  
☐ Other

(For example: "Diploma in anaesthesia", "Bachelors," "Masters," or "Certificate" etc)

Please enter the name here.

---

How many [africa\_np\_2] training programs are there in [africa\_country2]?

---

Please provide the names of the programs and the town in which they are located (For example: Anaesthetic Officer School Kampala, Anaesthetic Officer School Gulu)

---

Approximately how many new [africa\_np\_2]s graduate each year in [africa\_country2]? (From all programs combined)

---

**If there is more than one [africa\_np\_2] training program in [africa\_country2], please answer these questions for the specific program you know the best.**

Which program are you describing? (please give the name and/or location)

\_\_\_\_\_

What is the duration of the training program in number of months?

\_\_\_\_\_  
((months))

What are the requirements/qualifications for trainees to be eligible to enroll in this training program?

- ☐ Nursing degree
- ☐ Nursing diploma
- ☐ Secondary school
- ☐ Medical school degree
- ☐ Other

What are the other requirements/qualifications for trainees to be eligible to enroll in this training program?

\_\_\_\_\_

How much of the curriculum is taught by physician anaesthesiologists?

Please complete this even if you are uncertain of the answer.

- ☐ None
- ☐ Very little
- ☐ Some
- ☐ Most
- ☐ Almost all
- ☐ All
- ☐ I wish to comment further on this

Please comment

\_\_\_\_\_

How confident are you in this answer?

- ☐ Not at all confident
- ☐ Fairly confident
- ☐ Very confident

Do foreign/visiting faculty teach in the program?

- ☐ Yes
- ☐ No
- ☐ I do not know  
(Including both physician and non-physician faculty teachers)

What foreign organisations, institutions or funding agencies, if any, are formally supporting the program?

(Please state 'none' or 'I don't know' if applicable).

\_\_\_\_\_

---

Please select any sub-specialty areas that are taught during the program:

- ☐ Trauma management
- ☐ Obstetric anaesthesia
- ☐ Paediatric anaesthesia
- ☐ Cardiac anaesthesia
- ☐ Regional anaesthesia
- ☐ Neuroanaesthesia
- ☐ Critical care
- ☐ Information technology skills
- ☐ Teaching skills
- ☐ Management skills
- ☐ Ethics
- ☐ Law
- ☐ Other
- ☐ I am not sure

---

Please identify any other subspecialty areas covered in this training program.

---

---

Please select which methods of teaching/learning are used by the program:

- ☐ Lectures in classroom
- ☐ In-theatre supervision/instruction
- ☐ Simulation scenarios on mannequins
- ☐ Skills workshops in a classroom
- ☐ Online materials
- ☐ Workplace assessments
- ☐ Other
- ☐ I am not sure

---

Please identify any other teaching/learning methods used in this program.

---

**"For non-physician anaesthesia providers graduating from this program, please select the answer that best describes their training and practice for each of the following tasks:"**

	Yes, trained to perform independently	Trained to perform, but only with supervision	Not trained to perform	I'm not sure
Patient preoperative assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checking anaesthesia equipment prior to case	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparing medications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of venous cannulas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering medications (including narcotics)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering fluids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering blood products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of the surgical safety checklist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inducing general anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing spinal anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing epidural anaesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Airway management including intubation and LMA placement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional anaesthesia (peripheral nerve blocks, other than spinals)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining general anaesthesia with volatiles (ether, halothane, isoflurane, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining anaesthesia with ketamine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of arterial cannulas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of central venous access (internal jugular, femoral, subclavian)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video laryngoscopy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fiberoptic intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emergence from general anaesthesia including extubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing mechanical ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teaching anaesthesia trainees in theatre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicating directly with patients' families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

Thank you very much for completing this survey. If you have any additional comments to make, please enter them here. If you know about further programs in Africa, which were not covered here, and would be willing to complete information for those, please contact the survey organisers.  
(globalanesthesia@ucsf.edu)

Supplementary table 2: In-person and phone  
based abridged survey



# Anesthesia Provider Training Pathways Survey SSA 2018

This survey form is intended to be completed by study personnel only. Such personnel should call by phone the appropriate contact in the country of interest and ask these questions. The study personnel should record all responses.

The intention of this form is to collect data about each anesthesia training PATHWAY TYPE (defined by duration, prerequisites for entry, and degree awarded upon graduation). Do not repeat this form for each training program of the same 'pathway type.'

For example, if country X has 4 nurse anesthesia programs in the country, but only two distinct pathways - 2 that are 24months and 2 that are 36 months, then you would need to fill out two separate survey forms (not four).

Each survey form allows collection of data for:

one physician specialist pathway, one nurse anesthesia pathway, and one non-nurse/non-physician pathway per country.

For countries with more than one of any of the above pathways, you must complete a new survey for additional pathways. You may do this by re-opening the original link to this survey AFTER you submit the form.

Below are survey instructions for participants:

Participating in this survey is optional.

The survey will help us learn more about different practice models for anesthesia training delivery in low- and middle-income countries (LMICs), focusing on non-physician anaesthesia providers.

The survey will take about 15 minutes to complete, you can stop it at any time and the survey results will not be linked to your name.

If participants have questions, please direct them to: Fred Bulamba at fredflybulamba@gmail.com, Michael Lipnick at michael.lipnick@ucsf.edu or Hilary Edgcombe at hilary.edgcombe@nda.ox.ac.uk. If you have questions or concerns about your rights as a research participant, you can call the UCSF Institutional Review Board at 415-476-1814.

If you are willing to participate in this study, please continue.

PROVIDER DEFINITIONS:

1Physician (specialist) anaesthesiologist - graduate of a medical school who has completed a nationally recognized specialist anaesthesia training program/residency. These programs require graduation from medical school to enter.

2Non-specialist physician anaesthetist - a graduate of a medical school who has not completed a specialist training program/residency in anaesthesia but has undergone some FORMAL anaesthesia training. (For example a general practitioner who has done a formal training program to provide anesthesia. This is NOT referring to a surgeon who provides anesthesia but has not done a formal anesthesia training program.

3Nurse anaesthetists - a graduate of a nursing school who has also completed a nationally recognized nurse anaesthetist training program. These training programs require a nursing degree or diploma for entry.

4Non-physician, non-nurse anaesthetists - anaesthesia provider with no nursing degree, but who has completed a nationally recognized anaesthetist training program. These training programs do NOT require a nursing degree for entry and thus are non-nurse training programs (even though some who enter these pathways may have a nursing degree).

What is the phone number for the person providing information for this survey (the in-country contact)?	<div></div>
What is the email address for the person providing information for this survey (the in-country contact)?	<div></div>
What is the position or title of the person providing information for this survey (the in-country contact)? (e.g. Assistant Professor of Anesthesia)	<div></div>

Please select the country you are describing:

- ☐ Angola
- ☐ Benin
- ☐ Botswana
- ☐ Burkina Faso
- ☐ Burundi
- ☐ Cabo Verde
- ☐ Cameroon
- ☐ Central African Republic
- ☐ Chad
- ☐ Comoros
- ☐ Cote D'Ivoire
- ☐ DRC
- ☐ Equatorial Guinea
- ☐ Eritrea
- ☐ Ethiopia
- ☐ Gabon
- ☐ Gambia
- ☐ Ghana
- ☐ Guinea
- ☐ Guinea-Bissau
- ☐ Kenya
- ☐ Lesotho
- ☐ Liberia
- ☐ Madagascar
- ☐ Malawi
- ☐ Mali
- ☐ Mauritania
- ☐ Mauritius
- ☐ Mozambique
- ☐ Namibia
- ☐ Niger
- ☐ Nigeria
- ☐ Rwanda
- ☐ Sao Tome and Principe
- ☐ Senegal
- ☐ Seychelles
- ☐ Sierra Leone
- ☐ Somalia
- ☐ Somaliland
- ☐ South Africa
- ☐ South Sudan
- ☐ Sudan
- ☐ Swaziland
- ☐ Tanzania
- ☐ Togo
- ☐ Uganda
- ☐ Zambia
- ☐ Zimbabwe
- ☐ Congo (Brazzaville)
- ☐ Egypt
- ☐ Tunisia
- ☐ Morocco
- ☐ Libya
- ☐ Algeria

What types of anesthesia provider training pathway exist in this country? Select all that apply.

If this country has more than one distinct type for any pathway (e.g two nurse anesthesia programs of different duration), you will complete this survey page for one of them, then open a new survey link to enter information about the other).

- ☐ Program to train physicians as SPECIALIST anesthesiologists
- ☐ Program to train physicians as NON-SPECIALISTS in anesthesia
- ☐ Program to train NURSES as anesthesia providers
- ☐ Program to train NON-NURSE, NON-PHYSICIANS as anesthesia providers
- ☐ There are no anesthesia training programs in this country.

### Questions about physician specialist anesthesiologists in this country:

How many physician SPECIALIST anesthesiologists are actively practicing in this country?

\_\_\_\_\_

What is the duration of the physician SPECIALIST anesthesia training program in MONTHS (not including medical school)?

\_\_\_\_\_

How many of these physician specialist training programs are there in this country?

\_\_\_\_\_

Estimate how many physician specialist anesthesiologists graduate from all programs across the country, each year?

\_\_\_\_\_

When supervising physician specialist trainees in the operating theatre, how many trainees is the supervisor responsible for on average?

\_\_\_\_\_

### Questions about NURSE anesthesia program details

What qualification is awarded by the nurse anesthetist program?

- ☐ License
- ☐ Certificate
- ☐ Diploma
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Other

Describe the qualification awarded for the nurse anesthetist program

\_\_\_\_\_

What are the entry requirements for the nurse anesthetist program?  
(If there are multiple potential pathways/requirements for entry, please select "other" and describe as clearly as you can)

- ☐ Secondary school
- ☐ Nursing degree
- ☐ Nursing diploma
- ☐ Other

List the entry requirements for the nurse anesthetist program

\_\_\_\_\_

What is the duration of the nurse anesthetist training program in MONTHS?

\_\_\_\_\_

How many of these nurse anesthesia training programs are there in this country?

\_\_\_\_\_

Estimate how many nurse anesthetists graduate from all programs across the country, each year? \_\_\_\_\_

When supervising nurse anesthesia trainees in the operating theatre, how many trainees is the supervisor responsible for on average? \_\_\_\_\_

What proportion of lectures for the nurse anesthesia training program are provided by physician anesthetists?

- ☐ 0%  
☐ 1-50%  
☐ >50%

What proportion of clinical supervision during nurse anesthesia training is provided by physician specialist anesthesiologists?

- ☐ 0%  
☐ 1-50%  
☐ >50%

Is the nurse anesthesia training program dependent on visiting/temporary foreign faculty to teach in the program?

- ☐ Yes  
☐ No  
☐ I don't know

**For each of the following tasks, please select the option that best describes the level of training NURSE anesthesia providers receive (i.e. when they graduate from this program, what are they trained to do?)**

	Trained to perform independently	Trained to perform with physician supervision (supervisor directly present)	Not trained to perform	I am not sure
Preoperative assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checking anesthesia equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of venous cannula	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing regional blocks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing spinal anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inducing anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prescribing opioid pain medications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering blood products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obstetric anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pediatric anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Is there a national or regional exam that trainees must pass before they can practice? (In addition to university/school graduating exams)

- ☐ Yes  
☐ No  
☐ I don't know

Is there a government body or professional society that has created national practice guidelines for nurse anesthesia providers?

- ☐ Yes  
☐ No  
☐ I don't know

**The following section of questions is about NON-NURSE, NON-PHYSICIAN anesthesia training programs in this country**

What qualification is awarded by the non-nurse, non-physician program?

- ☐ License  
☐ Certificate  
☐ Diploma  
☐ Bachelor's degree  
☐ Master's degree  
☐ Other

Describe the qualification awarded by the non-nurse, non-physician program

\_\_\_\_\_

What are the entry requirements for the non-nurse, non-physician program?  
(If there are multiple potential pathways/requirements for entry, please select "other" and describe as clearly as you can)

- ☐ Secondary school  
☐ Nursing degree  
☐ Nursing diploma  
☐ Other

List the entry requirements for this non-nurse, non-physician program

\_\_\_\_\_

What is the duration of the non-nurse, non-physician training program in MONTHS?

\_\_\_\_\_

How many of these non-nurse, non-physician training programs are there in this country?

\_\_\_\_\_

Estimate how many non-nurse, non-physician anesthetists graduate from all programs across the country, each year?

\_\_\_\_\_

When supervising non-nurse, non-physician anesthesia trainees in the operating theatre, how many trainees is the supervisor responsible for on average?

\_\_\_\_\_

What proportion of lectures are provided by physician anesthetists in the non-nurse, non-physician program?

- ☐ 0%  
☐ 1-50%  
☐ >50%

What proportion of clinical supervision during non-nurse, non-physician anesthesia training is provided by physician specialist anesthetists?

- ☐ 0%  
☐ 1-50%  
☐ >50%

Is the non-nurse, non-physician training program dependent on visiting/temporary foreign faculty to teach in the program?

- ☐ Yes  
☐ No  
☐ I don't know

**For each of the following tasks, please select the option that best describes the level of training NON-NURSE, NON-PHYSICIAN anesthesia providers receive (i.e. when they graduate from this program, what are they trained to do?)**

	Trained to perform independently	Trained to perform with physician supervision (supervisor directly present)	Not trained to perform	I am not sure
Preoperative assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Checking anesthesia equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insertion of venous cannula	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing regional blocks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performing spinal anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inducing anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extubation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prescribing opioid pain medications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Administering blood products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obstetric anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pediatric anesthesia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Is there a national or regional exam that non-nurse, non-physician anesthesia trainees must pass before they can practice? (This does not include a university exam)

- ☐ Yes  
☐ No  
☐ I don't know

Is there a government body or professional society that has created national practice guidelines for non-nurse, non-physician anesthesia providers in this country?

- ☐ Yes  
☐ No  
☐ I don't know

### Additional comments

Additional comments/notes about anesthesia training in this country by study personnel:

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Supplementary table 3: Anesthesia training pathways in Africa



**Supplementary Table 3: Anesthesia training pathways in Africa**

Country	Entry Requirement <sup>a</sup>	Duration (months)	Qualification awarded <sup>b</sup>	NPAP Practice guideline	NPAP Standardized exam
Algeria	Medical doctor	48	Phys. Spec	No	Yes
	Nursing	36	Other		
Angola	Medical doctor	48	Phys. Spec	No	Yes
	Nursing	36	Other		
Benin	Medical doctor	48	Phys. Spec	Yes	No
	Nursing	24	Master's degree		
Botswana	Medical doctor	48	Phys. Spec	No	No
	Nursing	12	Other		
Burkina Faso	Medical doctor	48	Phys. Spec	No	Yes
	Nursing	24	Other		
Burundi	Medical doctor	60	Phys. Spec	No	No
	No clinical experience	42	Bachelor's degree		
Cameroon	Medical doctor	60	Phys. Spec	Yes	Yes
	Nursing	24	Other		
Central African Republic	Nursing	24	Unknown	No	No
Congo (Brazzaville)	Nursing	24	Other	No	No
Cote D'Ivoire	Medical doctor	48	Phys. Spec	No	No
	Nursing	36	Other		
DRC	Medical doctor	60	Phys. Spec	No	No
	Nursing	36	Other		
	Nursing or Other	9	Other		
Egypt	Medical doctor	48	Phys. Spec		
Eritrea	Nursing	36	Other		
Ethiopia	Medical doctor	36	Phys. Spec	Yes	No
	No clinical experience	48	Bachelor's degree		
	Nursing	12	Other		
	Other	24	Master's degree		
Gabon	Medical doctor	48	Phys. Spec	No	No
	Nursing	36	Master's degree		
Ghana	Medical doctor	36	Phys. Spec	Yes	Yes
	Nursing or Other	24	Bachelor's degree		
Kenya	Medical doctor	48	Phys. Spec	Yes	Yes
	Nursing	24	Other		
	Other	18	Other		

Liberia	Nursing	24	Other	Yes	Yes
Madagascar	Medical doctor	48	Phys. Spec	No	No
	No clinical experience	36	Unknown		
	Nursing	24	Master's degree		
Malawi	Medical doctor	48	Phys. Spec	No	No
	Nursing or Other	18	Other		
	Other	36	Bachelor's degree		
Mali	Medical doctor	48	Phys. Spec	No	No
	Nursing	24	Unknown		
Mauritania	Medical doctor	48	Phys. Spec	No	No
	Nursing	24	Other		
Morocco	Medical doctor	48	Phys. Spec	No	No
	Other	36	Bachelor's degree		
Mozambique	Medical doctor	48	Phys. Spec	Yes	Yes
	Nursing	24	Bachelor's degree		
Namibia	Medical doctor	6	Other	No	No
		48	Phys. Spec		
Niger	Nursing	36	Other	No	No
Nigeria	Medical doctor	36	Other	Yes	Yes
		72	Phys. Spec		
	Nursing	24	Other		
Rwanda	Medical doctor	48	Phys. Spec	Yes	Yes
	No clinical experience	36	Other		
		48	Bachelor's degree		
	Other	18	Bachelor's degree		
Senegal	Medical doctor	48	Phys. Spec	No	No
	Nursing	24	Other		
Sierra Leone	Nursing	12	Other	No	No
		18	Other		
Somaliland	Nursing or Other	18	Other	No	No
South Africa	Medical doctor	6	Other	Yes	Yes
		48	Phys. Spec		
South Sudan	Nursing	24	Other		
Sudan	Medical doctor	48	Phys. Spec	Yes	Yes
	No clinical experience	48	Bachelor's degree		
Swaziland	Nursing	24	Bachelor's degree		
Tanzania	Medical doctor	42	Phys. Spec	No	No
	Nursing	12	Other		
	Other	24	Other		

Togo	Nursing	24	Master's degree	No	No
Tunisia	Medical doctor	60	Phys. Spec	Yes	No
	No clinical experience	36	Other		
Uganda	Medical doctor	36	Phys. Spec	No	No
	Nursing or Other	24	Other		
		48	Bachelor's degree		
Zambia	Medical doctor	48	Phys. Spec	No	No
	Nursing or Other	24	Other		
Zimbabwe	Medical doctor	12	Other		
		36	Phys. Spec		
	Nursing	12	Other		

<sup>a</sup>Entry requirement: Other refers to a clinical position other than nursing (e.g. clinical officer, midwife, pharmacist). Nursing or Other indicates there were multiple possible entry requirements for the pathway.

<sup>b</sup>Phys spec: Physician specialist, Other qualification: Diploma, license, or certificate

Supplementary table 4: Anesthesia training pathways, by entry requirement

Entry requirement	Qualification awarded	Duration (months)	Country
Medical doctor	Other (Diploma, license, certificate)	6	Namibia
			South Africa
		12	Zimbabwe
		36	Nigeria
	Physician specialist	36	Ethiopia
			Ghana
			Uganda
			Zimbabwe
		42	Tanzania
		48	Algeria
			Angola
			Benin
			Botswana
			Burkina Faso
			Cote D'Ivoire
			Egypt
			Gabon
			Kenya
			Madagascar
			Malawi
			Mali
			Mauritania
			Morocco
			Mozambique
			Namibia
			Rwanda
			Senegal
			South Africa
			Sudan
			Zambia
		60	Burundi
			Cameroon
			DRC
			Tunisia
		72	Nigeria
No clinical experience	Bachelor's degree	42	Burundi
		48	Ethiopia
			Rwanda
			Sudan
	Other (Diploma, license, certificate)	36	Rwanda
	Unverified	36	Tunisia
Nursing (Clinical)	Bachelor's degree	24	Madagascar
			Mozambique
	Master's degree	24	Swaziland
			Benin
			Madagascar

	Other (Diploma, license, certificate)		Togo
		36	Gabon
		12	Botswana
			Ethiopia
			Sierra Leone
			Tanzania
			Zimbabwe
		18	Sierra Leone
		24	Burkina Faso
			Cameroon
			Congo (Brazzaville)
			Kenya
			Liberia
			Mauritania
			Nigeria
			Senegal
			South Sudan
		36	Algeria
			Angola
			Cote D'Ivoire
			DRC
			Eritrea
			Niger
	Unverified	24	Central African Republic
			Mali
Nursing or Other	Bachelor's degree	24	Ghana
		48	Uganda
	Other (Diploma, license, certificate)	9	DRC
		18	Malawi
			Somaliland
		24	Uganda
			Zambia
Other (Clinical)	Bachelor's degree	18	Rwanda
		36	Malawi
			Morocco
	Master's degree	24	Ethiopia
	Other (Diploma, license, certificate)	18	Kenya
		24	Tanzania

Entry requirement: Other refers to a clinical position other than nursing (e.g. clinical officer, midwife, pharmacist)