

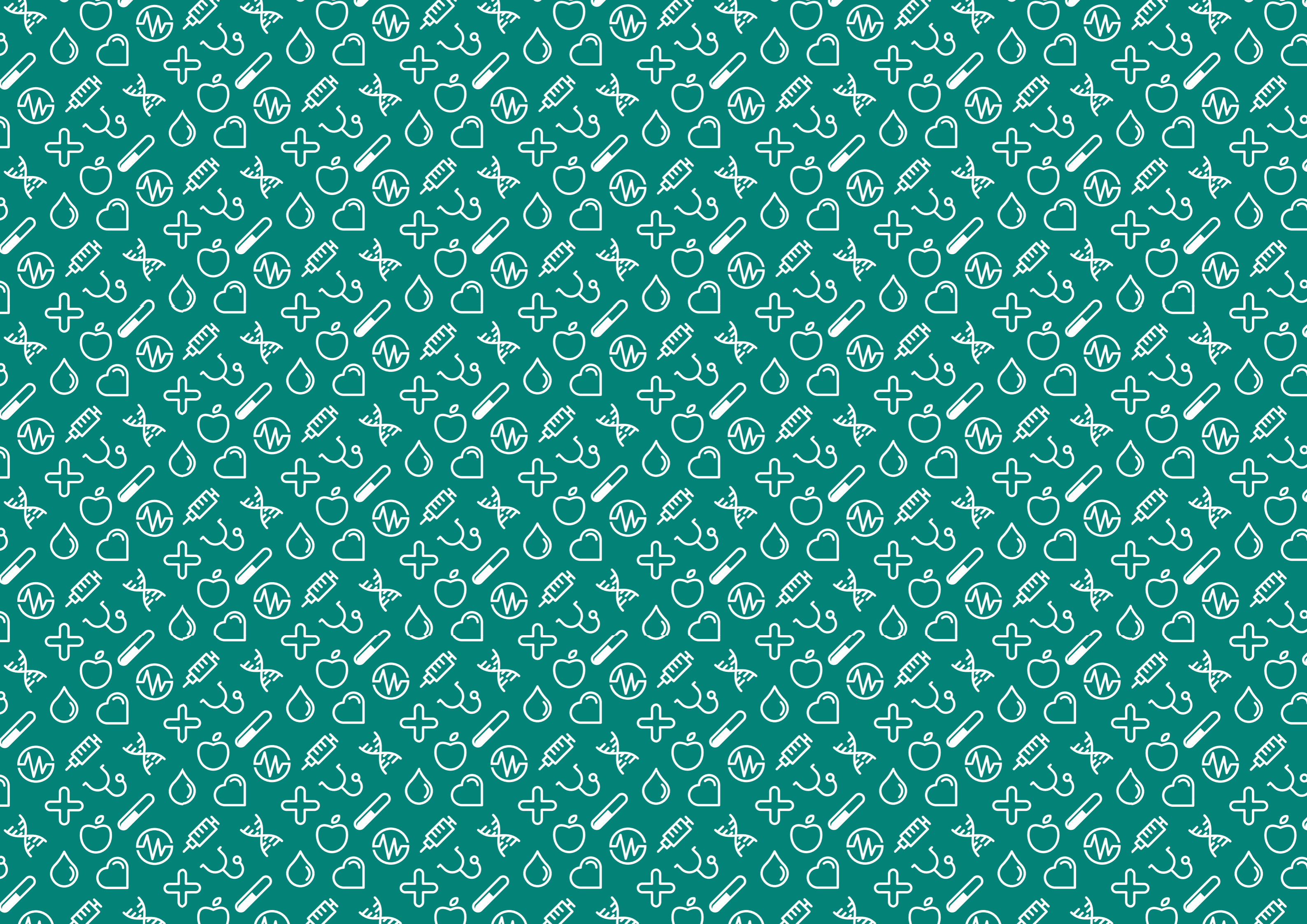


MSD for Mothers

Strengthening
South African
public sector
obstetric emergency
medical service
systems

EVALUATION REPORT 2019





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Data collected: **November 2018**

LIST OF ABBREVIATIONS

AEA	Ambulance Emergency Assistant
ALS	Advanced Life Support
BLS / BAA	Basic Life Support/Basic Ambulance Assistant
CCA	Critical Care Assistant
ECA	Emergency Care Assistant
ECP	Emergency Care Practitioner
ECT	Emergency Care Technician
EMC	Emergency Medical Care
EMD	Emergency Medical Dispatcher
EMS	Emergency Medical Services
ESMOE-IT	Essential Steps in the Management of Obstetric Emergencies – In Transit
FPD	Foundation for Professional Development
HRC	Health Research Committee
ILS	Intermediate Life Support
MMR	Maternal Mortality Ratio
MPC	Medical Practice Consulting
MSD	Merck Sharp & Dohme
NDOH	National Department of Health
OECO	Operational Emergency Care Orderly
REC	Research Ethics Committee
SDG	Sustainable Development Goals
SOP	Standard Operating Procedure
UNEG	United Nations Evaluation Group
WHO	World Health Organization

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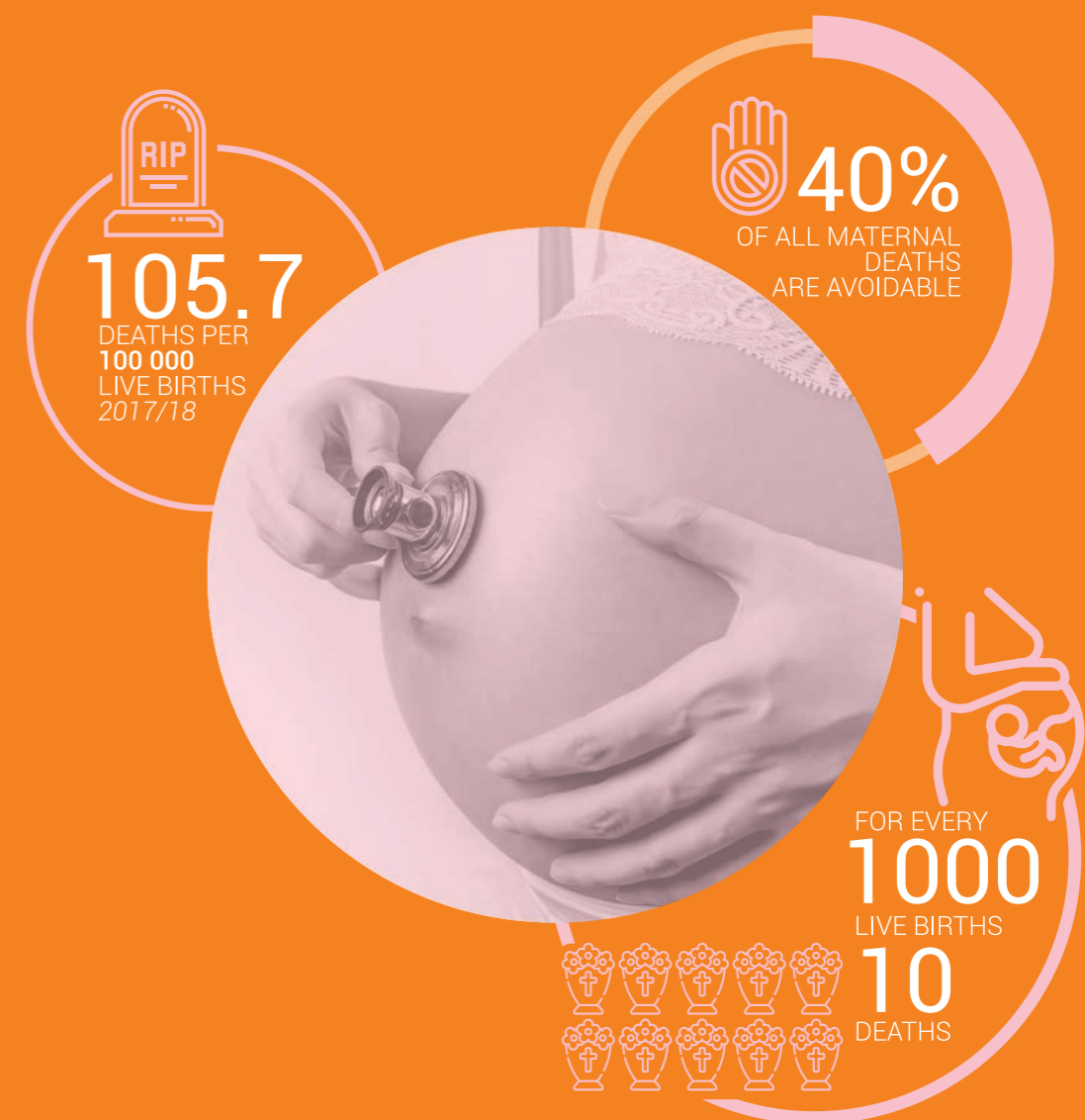
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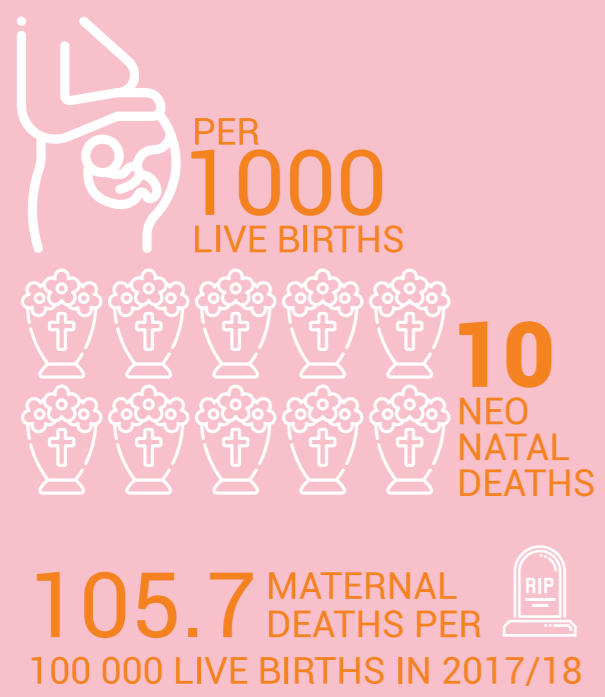
Executive Summary



EXECUTIVE SUMMARY

Introduction

In the last five years South Africa has made significant progress towards reaching the Sustainable Development Goals 3.1 and 3.2 of reducing maternal and neonatal mortality. The maternal mortality ratio has decreased from 133.3 deaths per 100 000 live births in 2013/2014 to 105.7 deaths per 100 000 live births in 2017/18. The national early neonatal mortality rate has remained stable between 2016/17 and 2017/18, at around 10 deaths per 1000 live births. It is estimated that 40% of all maternal deaths are avoidable and that maternal factors are among the most common reasons for perinatal death, and complications of pregnancy, labour and delivery are significant contributors.



In 2016, the Foundation for Professional Development (FPD) received funding from pharmaceutical company Merck Sharp & Dohme (MSD) to implement a three-year programme to improve maternal and infant survival through improving the quality of emergency care for pregnant mothers and/or new born babies during transit to health facilities. The programme was implemented in Capricorn district in the Limpopo Province, Amathole district in the Eastern Cape and Nkangala, Ehlanzeni and Gert Sibande districts in Mpumalanga. The programmes' objectives were to work with the South African National Department of Health (NDOH) to standardise and roll-out public sector EMS call centre protocols and standard operating procedures related to obstetric emergencies; to build the capacity of EMS personnel to provide care for obstetric emergencies in-transit; and to train call centre personnel on call centre protocols and the basics of obstetric emergency care in-transit. The training courses developed and implemented by FPD include the Essential Steps in Managing Obstetric Emergencies In-Transit (ESMOE-IT) Course, the Short Course in the Management of Obstetric Emergencies in Transit – Basic Life Support Cadre and the Short Course in EMS Call Centre Communications – Obstetric Emergencies.

The programme was evaluated as it was drawing to a close, to determine if it had resulted in the intended objectives and outcomes.

Programme Evaluation Methodology

The evaluation followed a concurrent triangulation design, whereby quantitative and qualitative data were collected and analysed separately and integrated during the interpretation of findings. The objectives of the evaluation were to determine the effectiveness of the MSD programme in transferring new knowledge to EMS personnel through training interventions; to describe the effectiveness of the MSD programme in improving the EMS system in terms of obstetrics care provided to mothers and babies during transit; to describe the challenges faced in emergency obstetrics care in South Africa; and to develop recommendations for further implementation of the programme by NDOH. The data collection team were asked to collect data from all individuals who were trained under this programme and all 47 EMS Stations and Communication Centres in the districts included in the study. No sampling was used in the selection of facilities.



THE FOLLOWING DATA COLLECTION ACTIVITIES TOOK PLACE DURING THE THREE-YEAR PROGRAMME:



The effectiveness of the training in transferring knowledge to participants was measured using pre- and post-course assessments.



Two to three months after the training, telephonic interviews were held with a sample of training participants and their supervisors to determine the impact that the training has had on their work environment.



A survey was conducted in December 2018 with the EMS Station and Communication Centre Managers in the districts where the programme was implemented. The survey aimed to gather information on the stations' available resources, specifically for obstetrics, as well as the challenges still faced in providing emergency medical services for obstetric emergencies.



Interviews were conducted in December 2018 with relevant stakeholders (key informants) in management positions in each district and province where the programme was implemented. The aim of the interviews was to gather information on the broader context of emergency medical services for obstetric emergencies in South Africa and stakeholder's perception of the MSD programme.

Quantitative data was descriptively analysed in MS Excel. Qualitative data was analysed through a combination of deductive and inductive thematic coding, using ATLAS.Ti 8.

QUANTITATIVE DATA WAS
DESCRIPTIVELY
ANALYSED

Evaluation Findings

As of December 2018, 692 people had been trained under the MSD programme. In total, 182 people were trained by FPD on the ESMOE-IT Master Training course, exceeding the target of 100. The analysis of the results from the pre- and post-course assessment found that the average score increased by 19%. One of the main aims of the Master ESMOE-IT training was to ensure that the delegates who attended be declared competent to cascade the training to their own districts, ensuring that the training intervention is sustainable. The cascaded training in Amathole district and the rest of the Eastern Cape was very successful, with 868 EMS personnel being trained. Limpopo and Mpumalanga faced various challenges in cascading the training in their districts, including not having the required equipment (e.g. birth simulator). 332 BLS personnel were trained on the Short Course in the Management of Obstetric Emergencies In-Transit and the average score obtained by the trainees increased by 16.44% after the course. A total of 101 Call Centre operators were trained on the Short Course in EMS Call Centre Communications, five times more than the target of 20. The trainees' average score for the pre- and post-course assessments increased by 20.42%. The analysis of the training assessment data shows that the MSD programme was successful in transferring new knowledge to EMS personnel.

Participants who were trained found the training to be extremely valuable and said that it improved the care that they were able to provide to obstetrics patients. One of the major improvements was in the ability of EMS personnel to ask patients the right questions, obtain a full history and hand-over the patient properly. It also gave them the knowledge and confidence to discuss the patients' treatment and care with the healthcare workers in the transferring and receiving facilities. Trainees highlighted that they now know more about obstetrics and the responsibilities of the various role-players during the transport of an obstetric patient.

Forty-seven EMS facilities were surveyed, 43 EMS Stations and four Communication Centres, an 88% response rate. The survey found that the EMS system still face a number of challenges, including a shortage of obstetric ambulances, as well as essential and obstetric equipment. There was a severe shortage of obstetric ambulances in the districts surveyed, with 74% of the EMS stations having no functioning obstetric ambulances. Obstetric patients in these cases are transported in general ambulances, which do not have the equipment needed to respond to an obstetric emergency. A total of 80% of the EMS stations reported that their ambulances are not sufficiently equipped to respond to medical emergencies. Interview respondents reported that EMS personnel often bring their own equipment (e.g. blood pressure machines) to work in order to do their job. A number of respondents were apprehensive that this programme would not have an impact if the other challenges faced are not addressed.

692 TRAINED UNDER MSD PROGRAMME
868 EMS PERSONNEL TRAINED - EASTERN CAPE WITH CASCADED TRAINING
332 BLS PERSONNEL TRAINED - SHORT COURSE IN MANAGEMENT OF OBSTETRIC EMERGENCIES IN TRANSIT
101 CALL CENTRE OPERATORS TRAINED - SHORT COURSE IN EMS CALL CENTRE COMMUNICATIONS

TRAINING STATISTICS

5X
MORE THAN THE TARGET OF 20

16.44%
INCREASE IN AVERAGE SCORE

SURVEYED

47
EMS FACILITIES

44
EMS STATIONS

4
COMMUNICATION CENTRES

88%
RESPONSE RATE

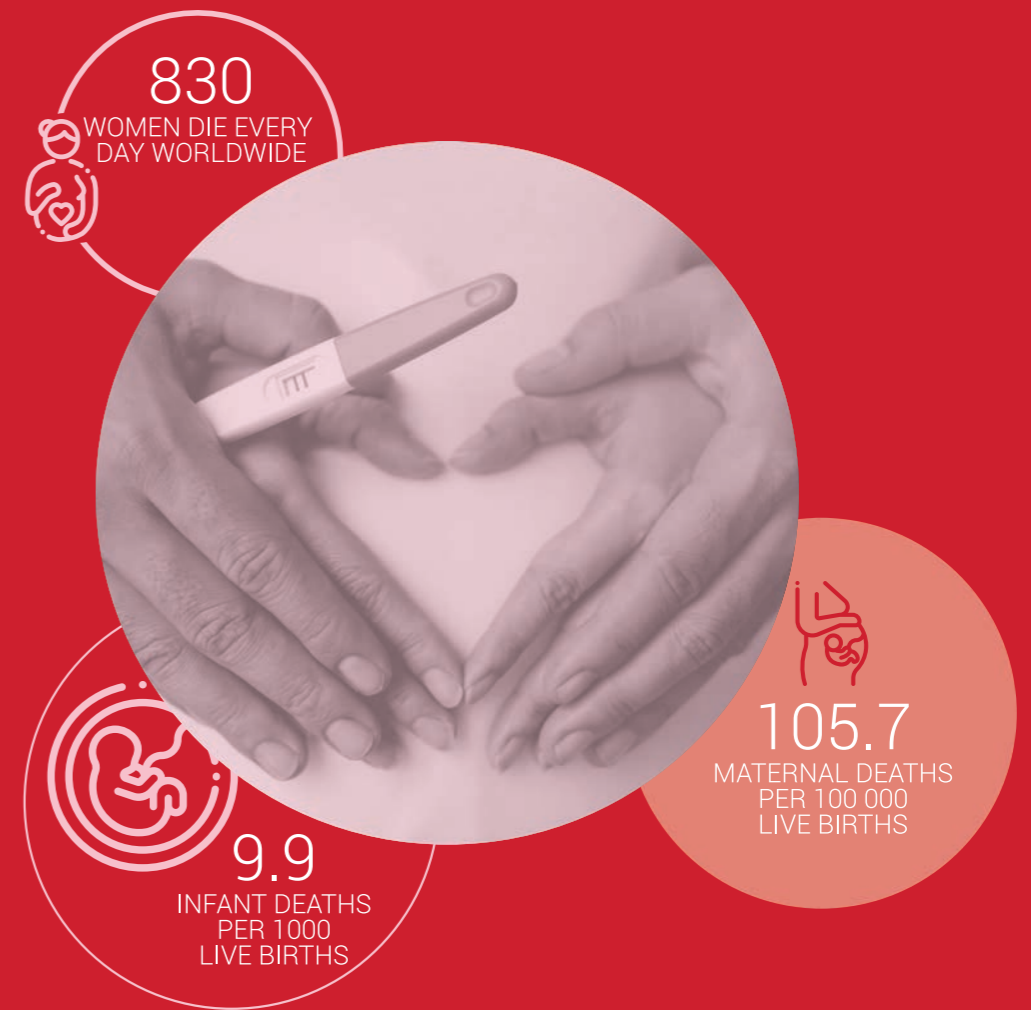


74%
OF THE EMS STATIONS HAVE NO FUNCTIONING OBSTETRIC AMBULANCE

80%
OF THE EMS STATIONS REPORTED AMBULANCES ARE NOT SUFFICIENTLY EQUIPPED

1

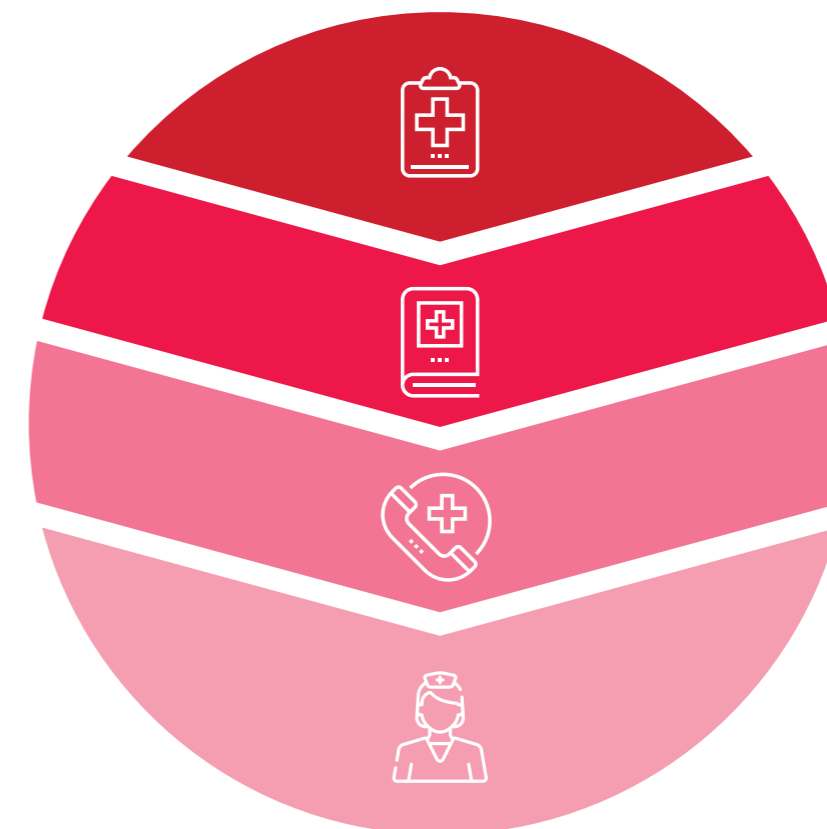
Introduction



INTRODUCTION

According to the World Health Organization (WHO), approximately 830 women die every day from preventable causes related to pregnancy and birth¹. Despite significant progress made, South Africa still has a high maternal and infant mortality rate at 105.7 maternal deaths per 100 000 live births and 9.9 infant deaths per 1000 live births in 2017/18². Yancy (2015), in a study of the implementation of obstetric Emergency Medical Service (EMS) systems in Mpumalanga and KwaZulu-Natal found that only with the addition of dedicated EMS maternal inter-facility transport ambulances, pre-positioned at maternal obstetric units, was a sustained decrease in maternal mortality ratios observed³. In response to the Yancy report, the Foundation for Professional Development (FPD) received funding from pharmaceutical company Merck Sharp & Dohme (MSD) to implement a three-year programme to improve maternal and infant survival through improving the quality of emergency care for pregnant mothers and/or new babies during transit to health facilities.

The MSD for Mothers programme was launched in 2016, with the following objectives:



Work with the South African National Department of Health (NDOH) to standardise and roll-out public sector EMS call centre protocols, clinical care protocols, Standard Operating Procedures (SOP's) and monitoring tools for obstetric emergency inter-facility transport services.



Develop high quality training material designed to build the capacity of EMS personnel to provide emergency medical care in-transit for women experiencing obstetric emergencies.



Train and orientate communication call centre personnel (operators and supervisors) on call centre protocols, monitoring tools and the basics of emergency care in-transit.



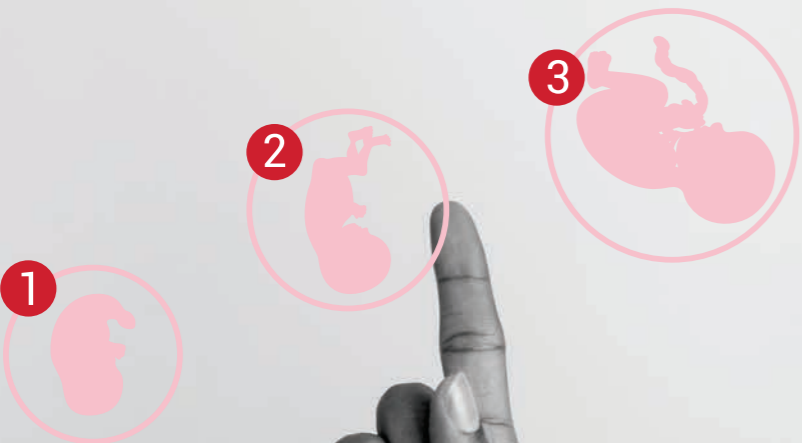
To train EMS personnel to provide high-quality, standardised care and management of obstetric emergencies in-transit. These courses include the Essential Steps in Managing Obstetric Emergencies In-Transit (ESMOE-IT) Course and Short Course in the Management of Obstetric Emergencies In-Transit Basic Life Support (BLS) Cadre.

¹ WHO Fact Sheet 2016. Found at: www.who.int/mediacentre/factsheet/fs348/en/

² Health Systems Trust 2019. District Health Barometer 2017/2018. Durban, South Africa

³ Yancy A. 2015. The implementation status of obstetric EMS systems in selected South African Health Districts with recommendations for future development. Emory University School of Medicine, Georgia, USA.

The programme was divided into three phases:



PHASE 1

Technical review and development of EMS protocols and guidelines.

PHASE 2

Development of training material and provision of training (including piloting) to Communication Centre and EMS Personnel.

PHASE 3

Scaling to targeted provinces.

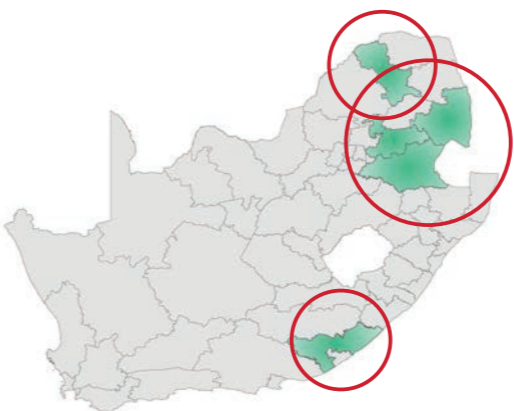


Figure 1. Location of Programme Implementation

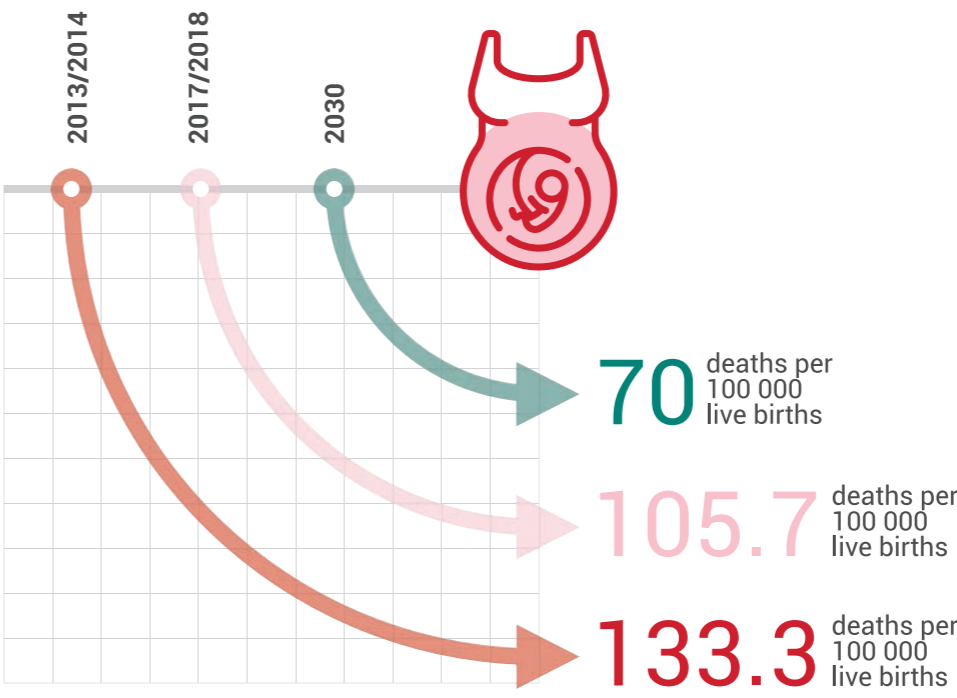
The programme was implemented in Capricorn district in the Limpopo Province, Amathole district in the Eastern Cape and Nkangala, Ehlanzeni and Gert Sibande districts in Mpumalanga (figure 1).

As the programme was drawing to a close, an evaluation was conducted to determine if the programme resulted in the intended objectives and outcomes. To plan and track the implementation of the programme, a detailed Logic Model (Annexure 1) was developed before the programme started in 2016. This was used as the basis for the evaluation plan.

2. Background

South Africa has experienced a decrease in maternal mortality ratios (MMR) in the past five years, from 133.3 deaths per 100 000 live births in 2013/2014 to 105.7 per 100 000 live births in 2017/18² Despite the progress made, South Africa is still far from reaching the Sustainable Development Goal (SDG) of reducing the MMR to less than 70/100 000 by 2030⁴.

All the provinces included in the programme showed a reduction in MMR since 2013/14, with the largest reduction experienced in Limpopo (Table 1). The Eastern Cape has the second highest MMR in the country after the Free State (Table 1).



² Health Systems Trust 2019. District Health Barometer 2017/2018. Durban, South Africa
⁴ United Nations Sustainable Development Goals. 2015. <https://sustainabledevelopment.un.org/sdg3#targets>

Table 1. Maternal Mortality in facility ratio by province, 2013/14 - 2017/18 (per 100 000 live births)²

	2013/14	2014/15	2015/16	2016/17	2017/18
Eastern Cape	156.2	148.3	128.0	127.6	128.3
Free State	143.4	217.8	122.1	148.4	132.9
Gauteng	104.5	112.6	103.8	114.7	108.5
KwaZulu-Natal	148.5	124.9	121.9	100.2	101.9
Limpopo	152.0	165.2	139.4	125.9	109.2
Mpumalanga	149.1	115.4	119.1	123.0	120.0
Northern Cape	118.9	254.1	103.8	87.5	65.9
North West	184.9	167.1	141.7	130.1	117.5
Western Cape	68.6	54.4	66.9	57.7	55.1
South Africa	133.3	132.5	115.6	111.5	105.7

At district level Capricorn, Limpopo has the worst MMR nationally for the second year running with 218.3 deaths per 100 000 live births (*Table 2*). All districts in the programme showed a decrease in MMR, except for Nkangala (*Table 2*). After investigation, we were informed by the EMS Manager in Nkangala that currently, many obstetric patients are transported from Gert Sibande District (specifically from Ermelo, Evander and Piet Retief) to Nkangala. Due to the long distances that ambulances travel in many cases, the mortality rates are high and those statistics are included in the Nkangala statistics and has thus shown a negative increase.

Table 2. Maternal Mortality in facility ratio by district, 2016/17 - 2017/18 (per 100 000 live births)

	2016/17 ⁵	2017/18 ²
Amathole, Eastern Cape	74.0	55.6
Capricorn, Limpopo	258.2	218.3
Nkangala, Mpumalanga	144.6	176.4
Gert Sibande, Mpumalanga	107.0	96.5
Ehlanzeni, Mpumalanga	131.8	103.5

Xhariep in the Free State and the Namakwa in the Northern Cape are the best performing districts in 2017/18, with zero maternal deaths per 100 000 live births².

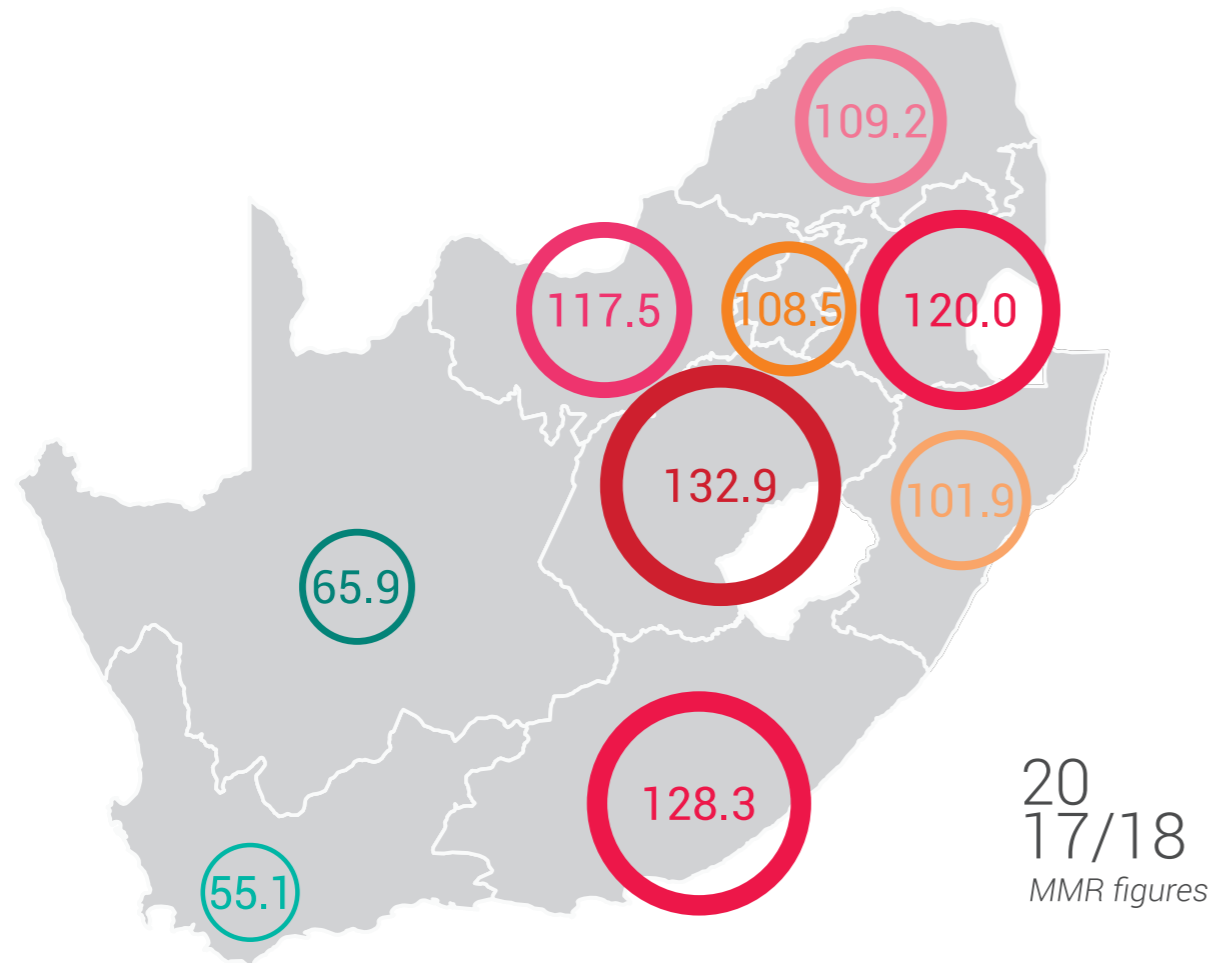
It is estimated that 40% of all maternal deaths are avoidable and are related to community, administrative and clinical factors. The five major causes of maternal death are non-pregnancy related infections (mainly HIV/AIDS), obstetric haemorrhage, complications of hypertension, pregnancy-related infections, and pre-existing medical conditions such as cardiac conditions⁶.

² Health Systems Trust 2019. District Health Barometer 2017/2018. Durban, South Africa
⁵ Health Systems Trust. 2017. District Health Barometer 2016/17. Durban, South Africa
⁶ National Department of Health. 2009. South Africa's National Strategic Plan for a campaign on accelerated reduction of maternal and child mortality in Africa (CARRMA).

MATERNAL DEATHS ARE RELATED TO
COMMUNITY, ADMINISTRATIVE &
**OBSTETRIC
FACTORS**

40%

OF ALL
MATERNAL
DEATHS ARE
AVOIDABLE

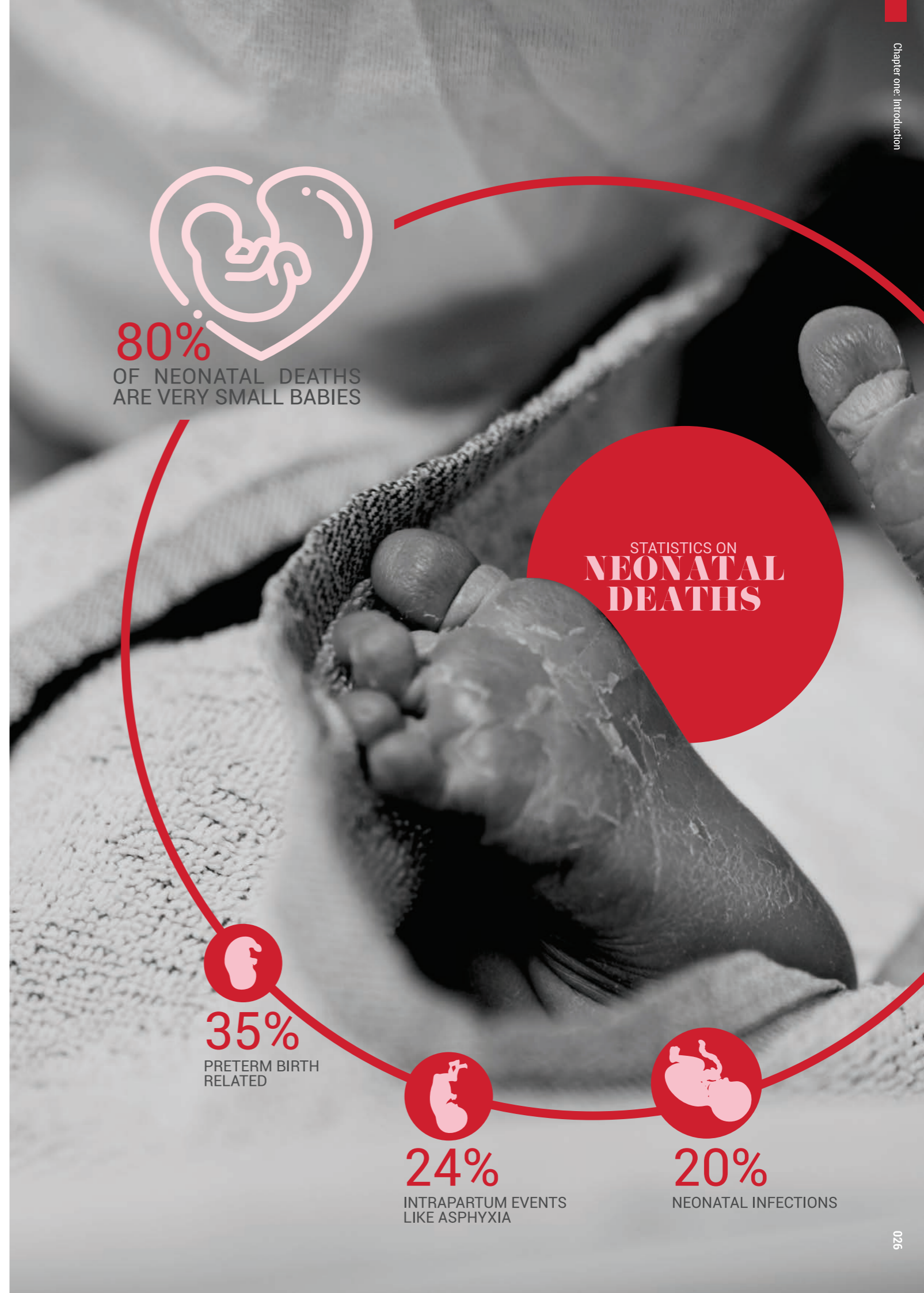


Seventy-three per cent of neonatal deaths occur in the first week of life and the day of birth has been described as the most dangerous. Very small babies account for 80% of these neonatal deaths, with 35% due to conditions related to preterm birth, 24% due to intrapartum events, including asphyxia, and 20% due to neonatal infections. According to the SDGs, by 2030 preventable new born deaths should be eradicated, and neonatal mortality should be reduced to 12 per 1000 live births⁴.

The national early neonatal death in facility rate has remained stable between 2016/17 and 2017/18, at around 10 deaths per 1000 live births (Table 3)². All the provinces included in the programme showed an increase in early neonatal death in facility rate (Table 3). However, they are all below the SDG's target for this indicator. The Eastern Cape had the second highest early neonatal death in facility rate, after the Free State (Table 3). The Western Cape had the lowest early neonatal death in facility rate for the second year in a row (Table 3).

Table 3. Early Neonatal death in facility rate per province
2016/17 - 2017/18 (per 1000 live births)

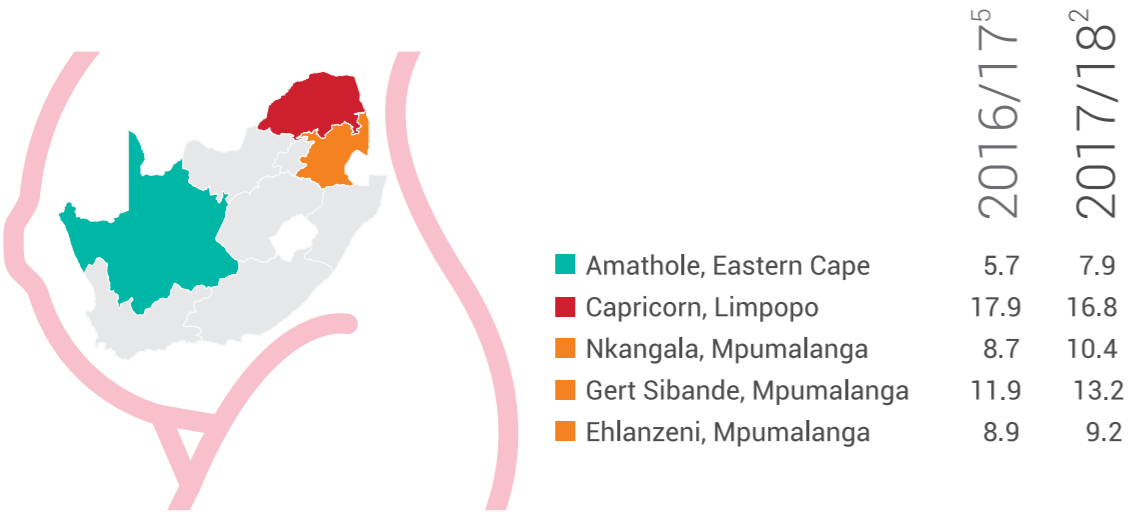
	2016/17 ⁵	2017/18 ²
Eastern Cape	10.8	11.8
Free State	11.4	12.0
Gauteng	10.0	10.2
KwaZulu-Natal	9.7	10.3
Limpopo	10.6	11.0
Mpumalanga	9.5	10.4
Northern Cape	13.4	10.0
North West	10.0	7.9
Western Cape	7.1	7.2
South Africa	9.9	10.2



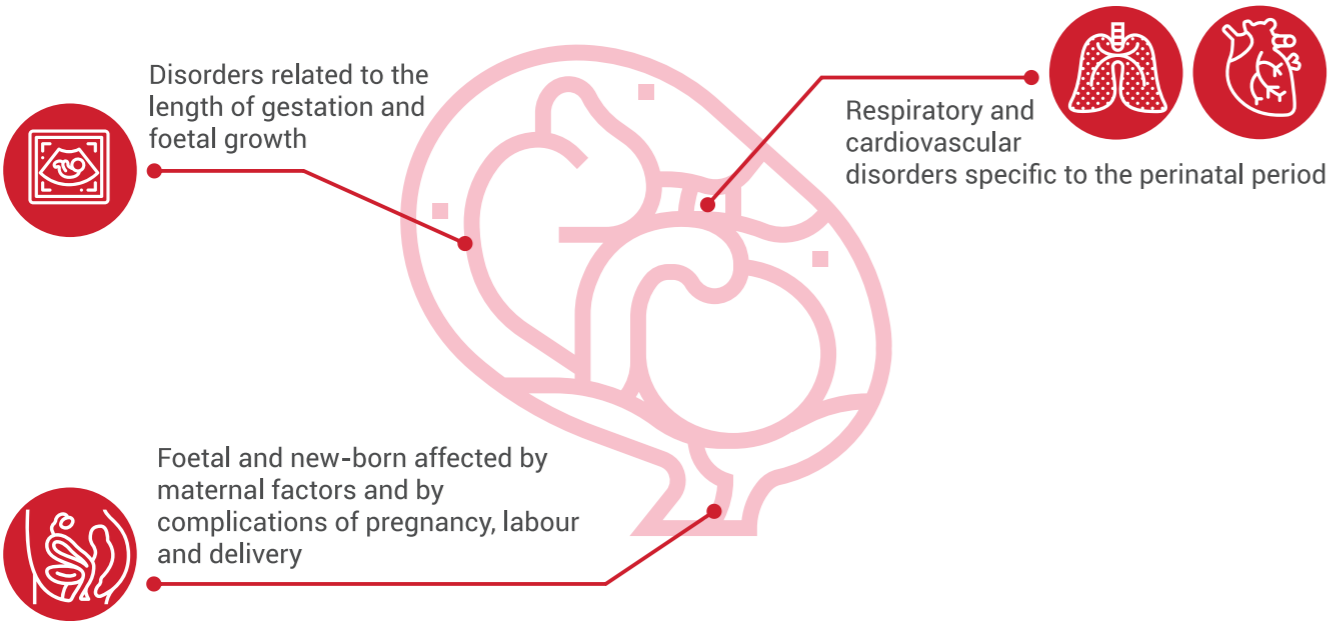
Capricorn had the highest early neonatal mortality rate between the districts included in the programme. However, it did decrease from 17.9 deaths per 1000 live births in 2016/17 to 16.8 deaths per 1000 live births in 2017/18 (Table 4). The early neonatal mortality rate in the other four districts included in the programme increased between 2016/17 and 2017/18. Amathole experienced the lowest early neonatal mortality rate between the districts included in the programme (Table 4).



Table 4. Early Neonatal death in facility rate, per district 2016/17 - 2017/18 (per 1000 live births)



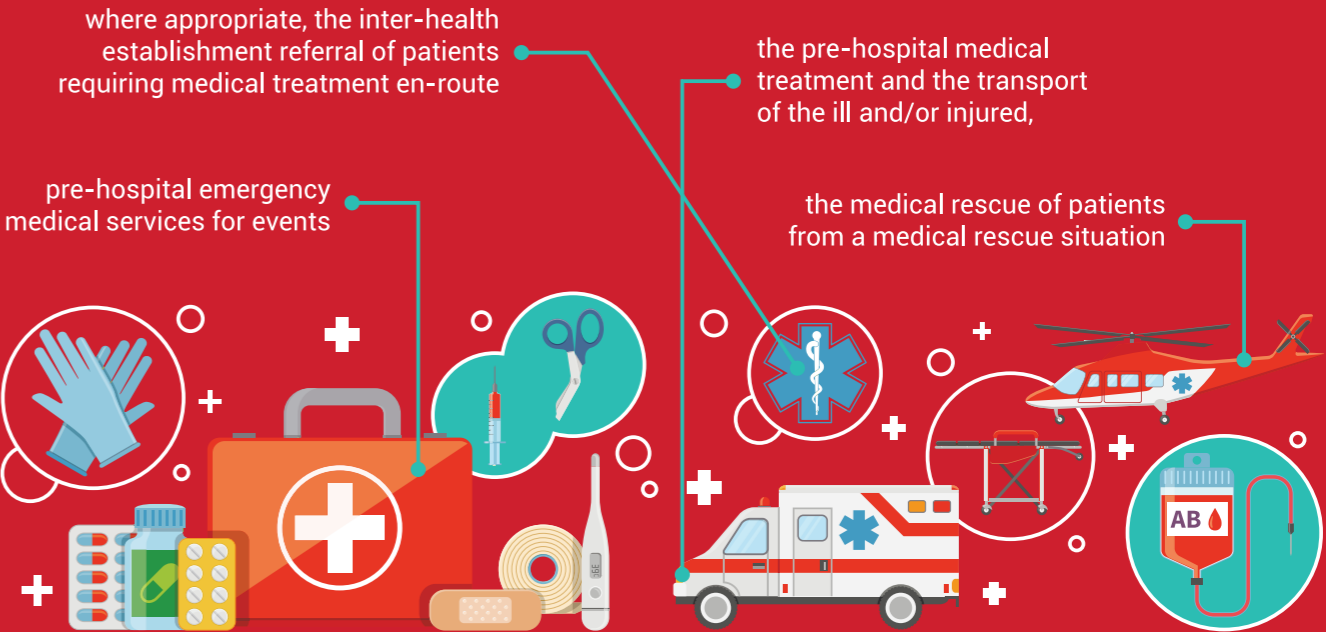
The following are the three most common causes of perinatal deaths⁷:



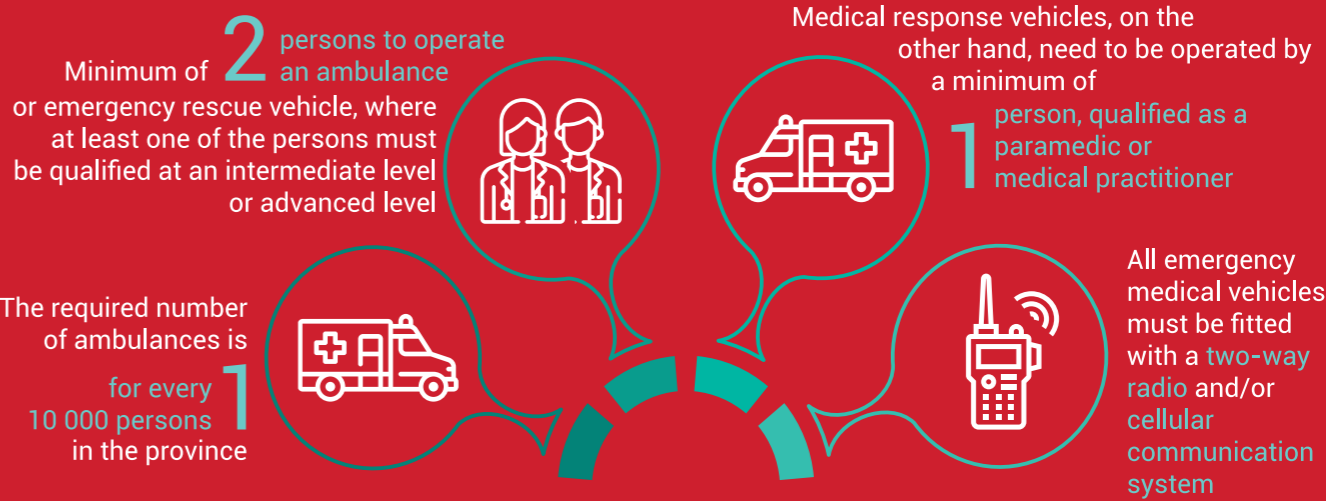
⁷ Rhoda N. 2016. Summary of the Statistics SA Perinatal Deaths in South Africa Report 2014. South Africa

It is reported that 72% of early neonatal deaths and 68% of stillbirths occur within a health facility (including hospitals, emergency rooms and nursing homes)⁷.

In South Africa, EMS is governed by the Emergency Medical Services Regulations (2014) in terms of Section 90 of the National Health Act of 2003⁸. These regulations define 'Emergency Medical Services' as 'any private or state organisation which is dedicated, staffed and equipped to offer:



Some of the other regulations included in the Act are:



The regulations also distinguish between types of emergency medical vehicles. An ambulance is defined as a 'vehicle licensed under the Road Traffic Act as such, designed or adapted for the treatment and conveyance of patients in an emergency care situation, marked as such, appropriately equipped, and staffed with a minimum of two emergency care providers⁸'. A Medical Rescue Vehicle is 'a vehicle to provide specialist rescue personnel and equipment to attend to a patient in a medical rescue situation and staffed with a minimum of two emergency medical services personnel who have been trained in medical rescue⁸'. A Medical Response Vehicle is a 'non-patient carrying vehicle' which is used for the purpose of transporting specialist medical equipment and to respond to a patient in an emergency care situation⁸.

⁸ Republic of South Africa. 2014. National Health Act 61 of 2003: Emergency Medical Services Regulations. www.greengazette.co.za/notices/national-health-act-61-2003-emergency-medical-services-regulations_20140724-GGR-37869-00585.pdf

THE FOLLOWING
PROFESSIONS ARE
REGISTERED UNDER THE
PROFESSIONAL BOARD FOR
EMERGENCY CARE UNDER
THE HEALTH PROFESSIONS
COUNCIL OF SOUTH AFRICA,
NAMELY⁹:



Basic Ambulance Assistant (BAA)

Ambulance Emergency Assistant (AEA)

Operational Emergency Care Orderly (OECO)

Paramedic

Emergency Care Technician (ECT)

Emergency Care Practitioner (ECP)

⁹ www.hpcsa.co.za/PBEmergencyCare

HEALTH
PROFESSIONS



In terms of training, there are currently three different levels of proficiency in short course training and there are two university qualifications. *Table 5* describes the categories of EMS staff.

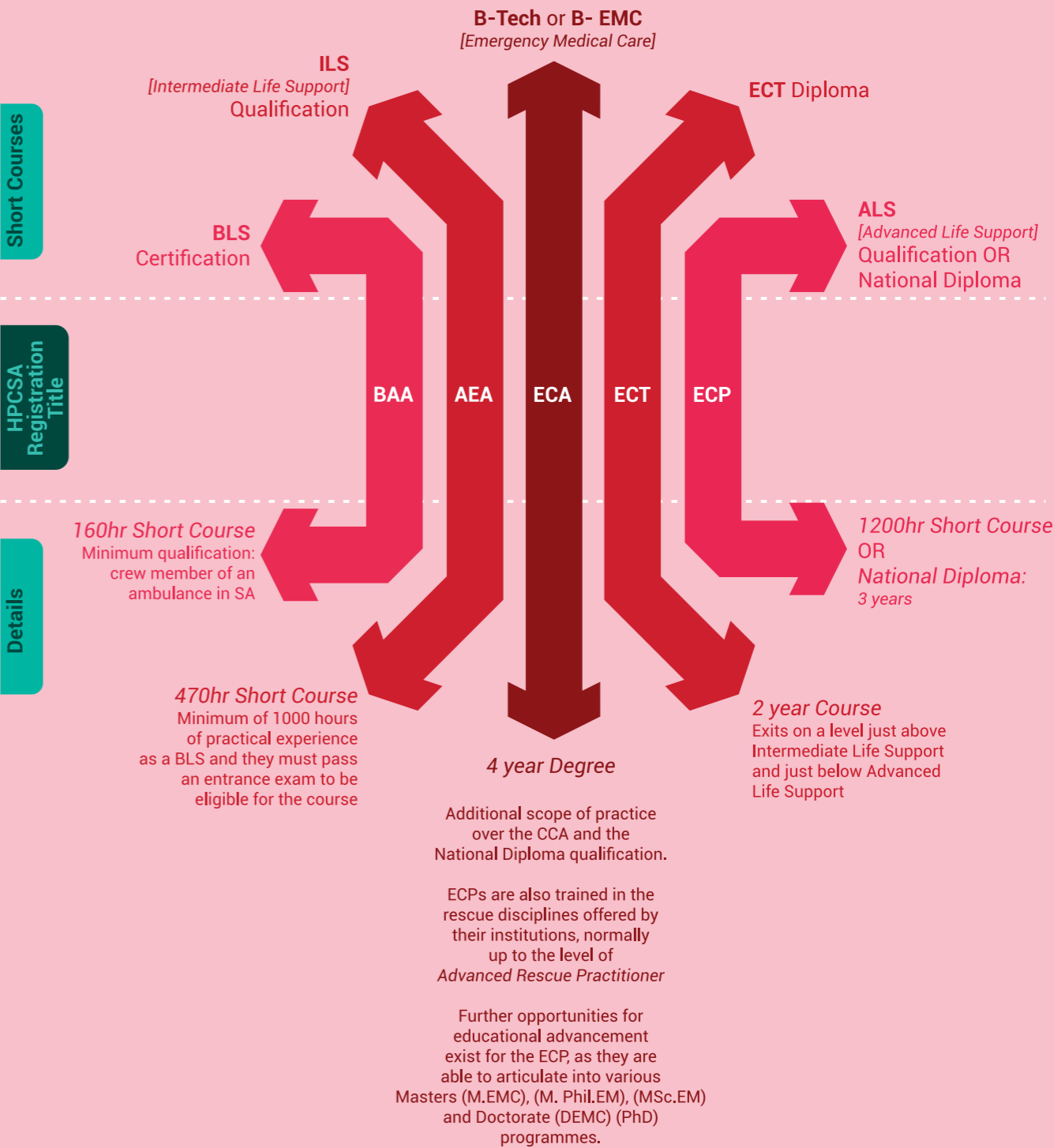
It must be noted that the short course route (i.e. BLS, ILS and ALS certifications) is in the process of being phased out and will no longer be offered after December 2019¹⁰. The HSPCA website states¹¹:

'This letter serves as a reminder that as from 1 February 2018 the BAA, OECO and Paramedic (CCA) qualifications will no longer entitle a person to registration with the HPCSA in these categories. However, any person who obtained these qualifications prior to the promulgation of the regulations on 27 January 2017 or within twelve (12) months after the date of the promulgation of the regulations will be entitled to register as BAAs, OECOs and Paramedics (CCA). It should however, be noted that the Professional Board for Emergency Care requires persons who have not registered within two (2) years of date of having obtained any of the qualifications in emergency care to comply with certain conditions, e.g. successful completion of an examination, etc. Persons whose names are on the BAA, OECO and Paramedic (CCA) register on 31 January 2018 will remain on the relevant registers if they pay their annual fees. The Board encourages Emergency Care Providers to ensure that their annual fees are paid to avoid the payment of penalty fees for the restoration of their names and compliance with any other requirements as may be determined by the Board for the restoration of names to the relevant registers. As from 1 February 2020 the Ambulance Emergency Assistant qualification and National Diploma in Emergency Medical Care will no longer entitle Ambulance Emergency Assistants and Paramedics (N DIP) to register with the HPCSA in these categories.'



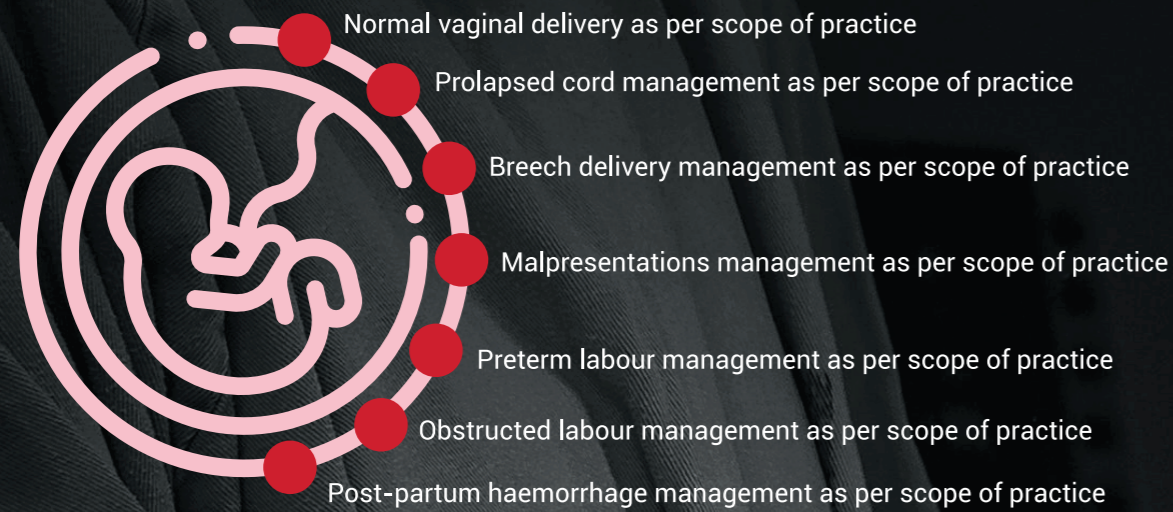
¹⁰ ER24. N.d. How to become a paramedic. www.er24.co.za/how-to-become-a-paramedic/
¹¹ HSPCA. N.d. New regulations for BAAs, AEAs and OECOs. www.hpcsa-blogs.co.za/date-for-registration-of-baas-aeas-and-oecos/

Table 5. EMS provider levels of proficiency¹²



¹² Arrive Alive. N.d. Different levels of emergency personnel. www.arrivealive.mobi/different-levels-of-emergency-personnel

Please see the scope of practice of the different EMS personnel in Annexure 2. In terms of obstetrics, all registered Emergency Care Providers may manage the following¹³:



BAAs are registered in the category 'supervised practice'. As a result, BAAs should not work independently without the direct supervision of an independent practitioner¹⁴. Ambulances should not be staffed with two BAAs, as they are not registered as independent practitioners.

BAA'S ARE ALSO NOT ALLOWED TO ADMINISTER DRUGS THAT ARE COMMONLY USED IN OBSTETRICS SUCH AS OXYTOCIN AND MAGNESIUM SULPHATE¹⁴.

PREVENTABLE CAUSES RELATED TO
**PREGNANCY
& BIRTH**

¹³ HSPCA. 2018. Clinical Practice Guidelines: Annexure A List of capabilities and medications www.hpcs.co.za/Uploads/editor/UserFiles/downloads/emergency_care/CLINICAL_PRACTICE_GUIDELINES_PROTOCOLS_2018.pdf

¹⁴ HSPCA. 2017. General Board Rulings. www.hpcs.co.za/Uploads/editor/UserFiles/downloads/emergency_care/GENERAL_BOARD_RULINGS_JUNE_2017_FINAL.pdf

2

Programme Evaluation Methodology



APPROACH

According to Creswell (2009), problems that are addressed through health and social science research are complex, which makes either quantitative or qualitative methods insufficient when used separately, therefore, mixed methods were used¹⁵. The Evaluation followed a concurrent triangulation design (Figure 2), whereby quantitative and qualitative data were collected and analysed separately and integrated during the interpretation of findings.

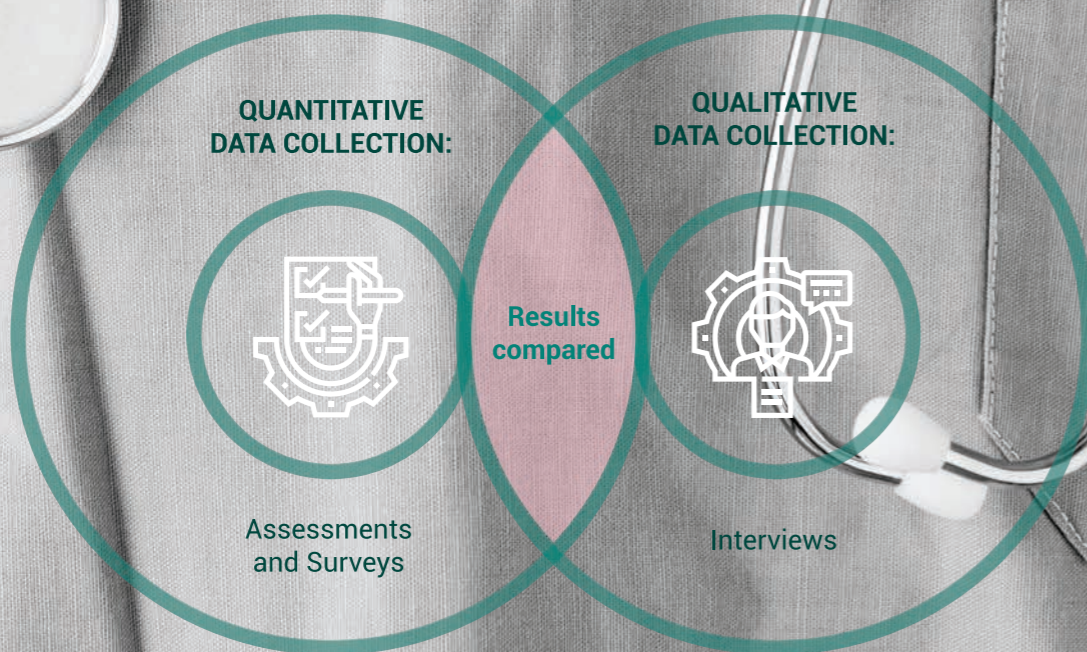
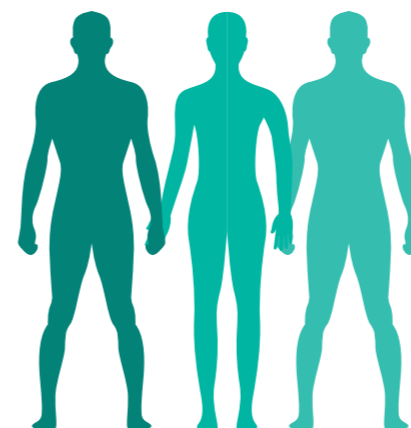


Figure 2. Concurrent triangulation design

¹⁵ Creswell, J. W. (2009). Research Design Qualitative, Quantitative, and Mixed Methods Approaches (3rd ed.). Thousand Oaks, CA Sage Publications.

2. Sample

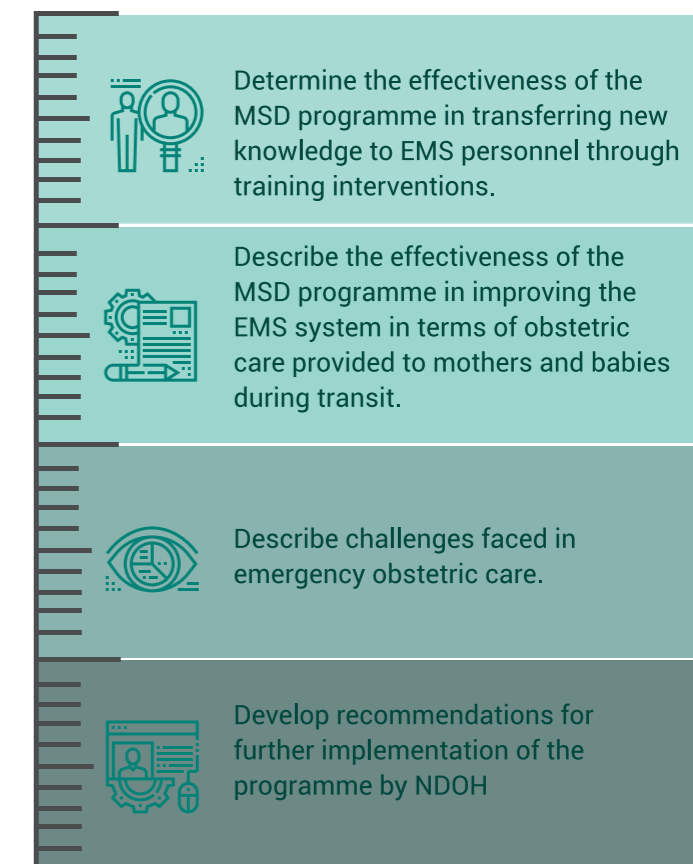
The data collection team were asked to collect data from all individuals who were trained under this programme and all 47 EMS Stations and Communication Centres in the districts included in the study. Therefore no sampling was used. The list of the EMS stations and Communication Centres were compiled in collaboration with the EMS manager and coordinators from the provinces. There were three population groups in this study:



- The EMS personnel trained under the programme
- The EMS Station and Communication Centres Managers
- Provincial EMS managers and coordinators

3. Objectives

The objectives of the evaluation were to:



4. Data Collection

A number of data collection activities took place over the three-year programme. Each is described below (Figure 3).

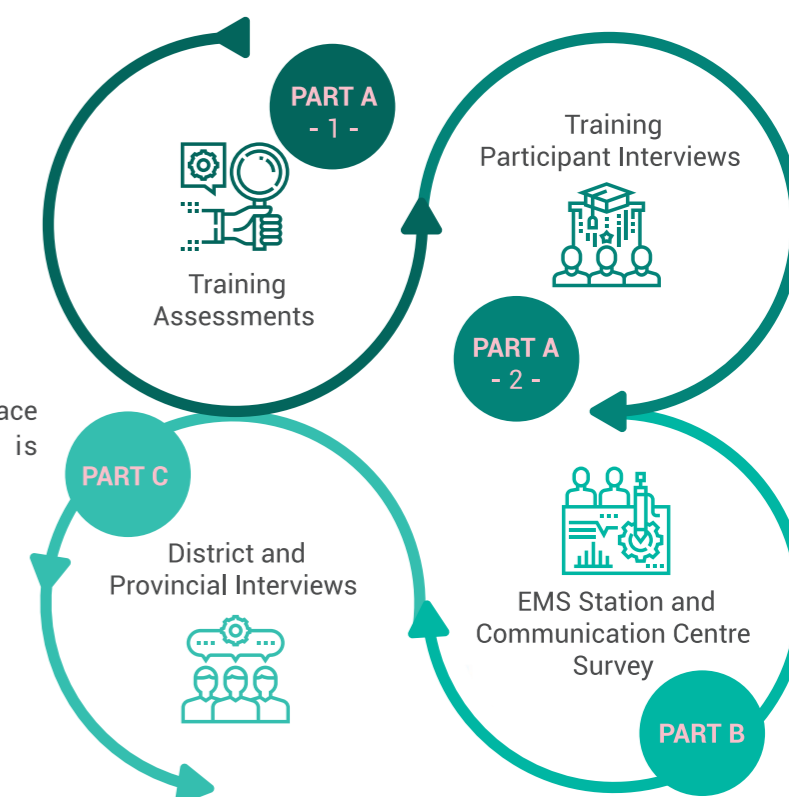
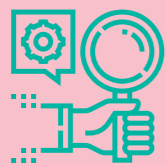


Figure 3. Data Collection Diagram

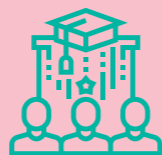


A1. Training Assessments

The effectiveness of the training in transferring knowledge to participants was measured using pre- and post-course assessments. The assessments asked participants a number of multiple choice and true/false questions that were based on the contents of the specific course. The pre- and post-course assessments were not voluntary.

Training participants were required to obtain 70% for the post-course assessment in order for them to pass the course and receive the certification.

The pre- and post course assessments for the ESMOE-IT Course and BLS Cadre Course were conducted on paper. These were handed out by the course anchor or facilitator on the first and last day of the training. Course anchors and facilitators were provided with a detailed brief of how the assessments should be administered, that participants should complete the assessment on their own, and that they were not allowed to use their course manual to answer the questions. The pre- and -post course assessments for the Short Course in EMS Call Centre Communications were conducted online through the FPD online learning portal.



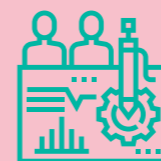
A2. Training Interviews

Telephonic interviews were held with a sample of training participants and their supervisor to determine the effect that the training has had on their work environment. The interviews were held two to three months after the training. Data collectors were provided with one-day training from the evaluation manager on the MSD Programme on the evaluation and data collection procedures.

The data collectors were provided with a list of the training participants who had completed their course. Participants were randomly selected from this list. The researchers aimed to reach 10% of the participants who had completed the training. The training participants were asked to provide the contact details of their supervisor to invite them to participate in an interview.

Participation in the interviews were voluntary. The participants were initially read a description of the evaluation and interview, and an explanation of informed consent. They were then asked if they understood what was read to them and if they consented to participate.

A semi-structured interview schedule was used by the data collectors. The interview discussed challenges that the participants experienced in implementing what was learnt during the training, as well as 'success stories' that highlighted the impact that the programme had in the field.



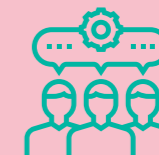
B. EMS Station and Communication Centre Survey

A survey was conducted in December 2018 with the EMS Station and Communication Centre Managers in the districts where the programme was implemented. Data collectors were specifically recruited for this activity. They were provided with two-day training from the evaluation manager on the MSD Programme on the evaluation, data collection procedures and how to use the tablet.

The survey aimed to gather information on the stations' available resources, specifically for obstetrics, as well as the challenges still faced in providing emergency medical services for obstetric emergencies. The survey also obtained responses from the station managers on their perception of the MSD programme.

This survey was developed using Delvy, an application developed by Quode, whereby data can be collected electronically using a tablet or mobile phone. The cloud-based software stores the data until it is exported by the researcher. Access to the data stored on the cloud is password restricted.

The team developed a database containing the information and contact details of all EMS Stations and Communication Centres in the five districts, based on information obtained from EMS managers and coordinators from the provinces. This database was used by the data collection team to contact each station or centre to schedule a site visit. In cases where the data collectors could not schedule a visit telephonically, they physically went to the station or centre to schedule the visit. Participation in the survey was entirely voluntary and respondents could refuse to participate.



C. District and Provincial Manager Interviews

Interviews were conducted in December 2018 with relevant stakeholders (key informants) in management positions in each district and province where the programme was implemented. The interviews were conducted by the data collectors who administered the survey. The stakeholders included District EMS Coordinators, Operations Managers and Provincial Managers.

The aim of the interviews were to gather information on the broader context of emergency medical services for obstetric emergencies in South Africa and their perception of the MSD programme. A semi-structured interview schedule was used by the data collectors.

The interview was voluntary, participants were provided with an informed consent form to complete. The data collectors also provided a description of the evaluation, purpose of the interview and an explanation of informed consent. If the participant agreed to participate, they were asked to sign the informed consent form.

5. Data Analysis

The data collection team were asked to collect data from all individuals who were trained under this programme and all 53 EMS Stations and Communication Centres in the districts included in the study. There was therefore no sampling used. The list of the EMS stations and Communication Centres were compiled in collaboration with the EMS manager and coordinators from the provinces.



5.1 Quantitative Data

All data was anonymised during analysis. Data from the paper-based training assessments was captured in MS Excel, coded and descriptively analysed. Data from the e-learning portal (Short Course in EMS Call Centre Communications) was exported into MS Excel, cleaned, coded and descriptively analysed.



5.2 Qualitative Data

The interviews were recorded for analysis and transcribed verbatim. The qualitative data was analysed through a combination of deductive and inductive thematic coding, using ATLAS.Ti 8. The transcripts were initially read as a whole and notes were made at the end. Codes were developed and grouped as categories under each theme. Themes were drawn from the semi-structured interview schedules and added to the coding frame.

A combination of structural and pattern coding was used. Structural coding is content-specific and is applied to segments of text in order to categorise the data according to specific research questions¹⁶. Pattern coding is used to categorise similarly coded data, resulting in pattern codes that assist in the development of major themes¹⁷. A diagram of the themes found can be seen in Annexure 3.

6. Data Management, Trustworthiness and Quality Assurance

According to Shenton (2004), in order for the findings to be trustworthy, they have to be credible (internal validity), transferable (external validity/generalisability), dependable (reliability) and confirmable (objectivity)¹⁷. To ensure credibility, the data collection team adopted the correct operational procedures in the collection and analysis of the data. Moreover, the data collection team triangulated different data collection techniques and data sources, used iterative questioning during interviews, and ensured that the data collection only involved participants who volunteered to participate.

For transferability, the data collection team provided the necessary information so that the findings of this evaluation can be applied to similar situations. This information consisted of a description of the EMS context, a time period of data collection procedures, the number of data collection opportunities, the data collection methods used and the number of participants.

The data collection team reported the processes of this evaluation in detail so that future researchers can repeat the work. Specifically they provided a description of the evaluation design, how it was executed and how effective it was. This is reported in order to enhance the dependability of the evaluation.

Confirmability 'is the qualitative investigator's comparable concern to objectivity'¹⁸. It is important that the findings accurately reflect the experiences and ideas of the participants and not the preferred recollections of the investigator. To improve the confirmability of the evaluation the data collection team used triangulation strategies to reduce the effect of investigator bias. An example of this strategy is the use of multiple data collectors in this evaluation.

7. Ethical Considerations and Approvals

FPD has an in-house Research Ethics Committee (REC), registered with the National Research Ethics Council of South Africa, who reviewed the protocol and provided approval based on the risk, duration and budget of the evaluation. The evaluation team worked closely with the FPD REC to ensure that all measures were taken to protect the rights of the respondents. The training assessments didn't require ethical clearance from the FPD REC. Ethical clearance was obtained on 25 June 2018. The evaluation team proceeded to apply for approval from the three provinces included in the evaluation. Letters of support were initially obtained from the relevant Department of Health EMS officials at district level. These letters, along with the FPD ethical clearance and evaluation proposal were submitted to the Health Research Committees (HRC) in Mpumalanga, Limpopo and Eastern Cape in July 2018. Approval from the Eastern Cape HRC was received on 4 September 2018, from the Mpumalanga HRC on 29 October 2018 and from the Limpopo HRC on 31 October.

The Eastern Cape and Mpumalanga approvals could be applied for through the National Health Research Database (NHRD). However, the Limpopo application had to be submitted in hard copy. Regardless of the channel used for the application, numerous follow-ups had to be made to receive updates on the progress of the applications.

The data collection team strictly adhered to the ethical guidelines set out in the Belmont Reports, as well as in accordance with the principles outlined in the UN Evaluation Group (UNEG) Ethical Guidelines for Evaluation¹⁸.

¹⁶ Saldaña, J. (2009). The coding manual for qualitative researchers. London: SAGE

¹⁷ Shenton, A. K. 2004. Strategies for ensuring trustworthiness in qualitative research projects. Education for Information 22:63-75.

¹⁸ United Nations Evaluation Group. 2016. Norms and Standards for Evaluation. New York: UNEG



RESPECT FOR PERSONS

7.1 Respect for Persons

According to the Belmont Report, respect for persons has at least two ethical stances. Firstly, participants should be given the opportunity to act autonomously and be capable of deliberation. Secondly, those who cannot act autonomously, such as the mentally handicapped, should be protected¹⁹. An autonomous person is an individual capable of deliberation about personal goals and of acting under the direction of such deliberation. To respect autonomy is to give weight to autonomous persons' considered opinions and choices while refraining from obstructing their actions²⁰. All participants in the evaluation were given adequate information to make an informed decision whether or not to participate in the evaluation and were not improperly pressured to participate. During data collection, the opinions of the interviewees and respondents were valued and respected by the data collection team.

¹⁹ National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research. 1979. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. U.S. Department of Health & Human Services

²⁰ National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research. 1979. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. U.S. Department of Health & Human Services

7.2 Beneficence

Beneficence is seen as an obligation to the participants, specifically that no harm should be caused to them, possible harms should be minimised and that all benefits should be maximised. There were no perceived risks to participating in this evaluation, however participants were provided with contacts who could provide support should an adverse reaction be experienced.

The intention of this evaluation was to provide all the stakeholders with information on the success of the MSD programme, possible gaps in service delivery how these can be addressed. This information could be used in future to improve the quality of EMS services for obstetric emergencies. The data collection team ensured that a comprehensive report was developed to achieve this goal.

7.3 Justice

The Belmont report asks the question 'who ought to receive the benefits of research and bear its burdens?'. It also provides the following example to illustrate justice in research, "During the 19th and early 20th centuries the burdens of serving as research subjects fell largely upon poor patients, while the benefits of improved medical care flowed primarily to private patients." It states that the selection of research subjects needs to be scrutinised in order to determine whether some groups of people (e.g. welfare patients, particular racial and ethnic minorities, or persons confined to institutions) are being systematically selected simply because of their easy availability, their compromised position, or their manipulability, rather than for reasons directly related to the problem being studied. The evaluation team made sure that the participants were selected fairly without any form of coercion or bias and that the samples were representative of all the facilities where data were collected. This report is intended to aid in the equal distribution of the benefits of this evaluation.



PROVIDE INFORMATION ON
SUCCESS

ANALYSING THE
DATA

A) CONFIDENTIALITY AND ANONYMITY

All data collected for the evaluation was, and will be, kept confidential. Only the evaluation manager has access to the raw data, which is kept securely (password protected) on the FPD server. Data was anonymised during analysis and transcription, as far as possible. No names or identifying individual information is disclosed in the report or presentation of results.

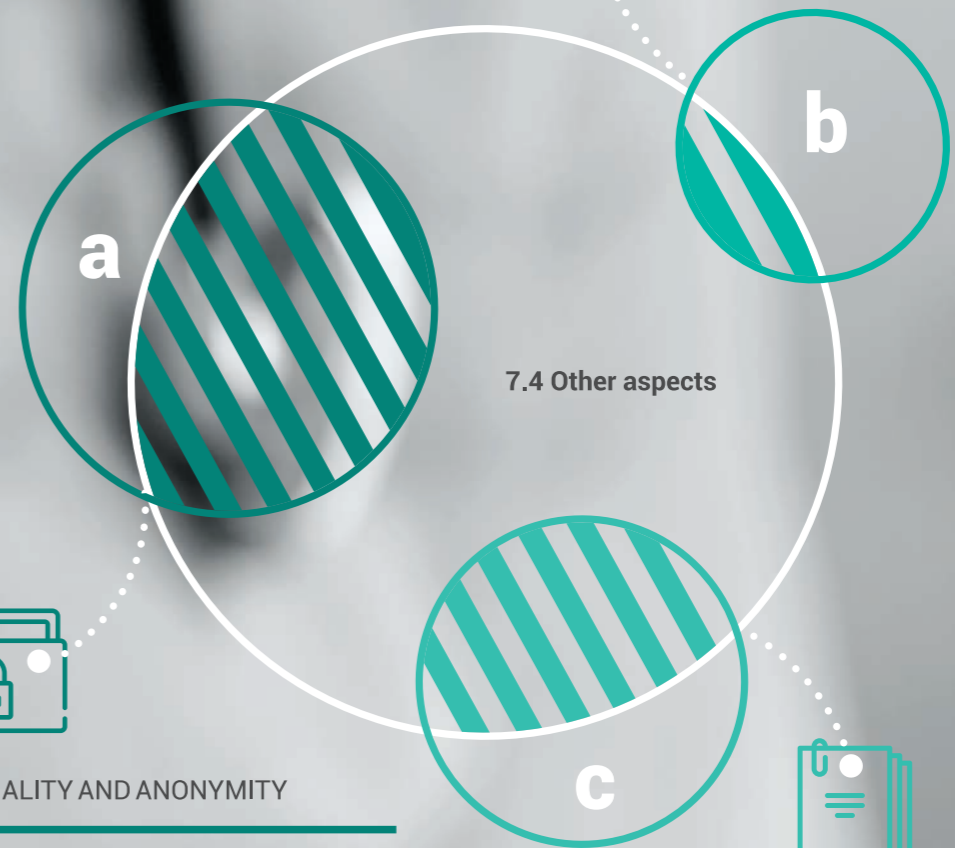
B) INCENTIVES

Participants were in no way incentivised to participate in the evaluation.



C) DISSEMINATION OF INFORMATION

The findings of this evaluation will be described in a report, which will be distributed and presented to MSD, NDOH provincial stakeholders and evaluation participants. The report will be used by these individuals for decision-making. The findings of the evaluation may also be disseminated through journal articles and conference presentations.



3

Evaluation Findings



MSD
PROGRAMME
TRAINED
692
PEOPLE
UP TO DECEMBER 2018

EMS TRAINING

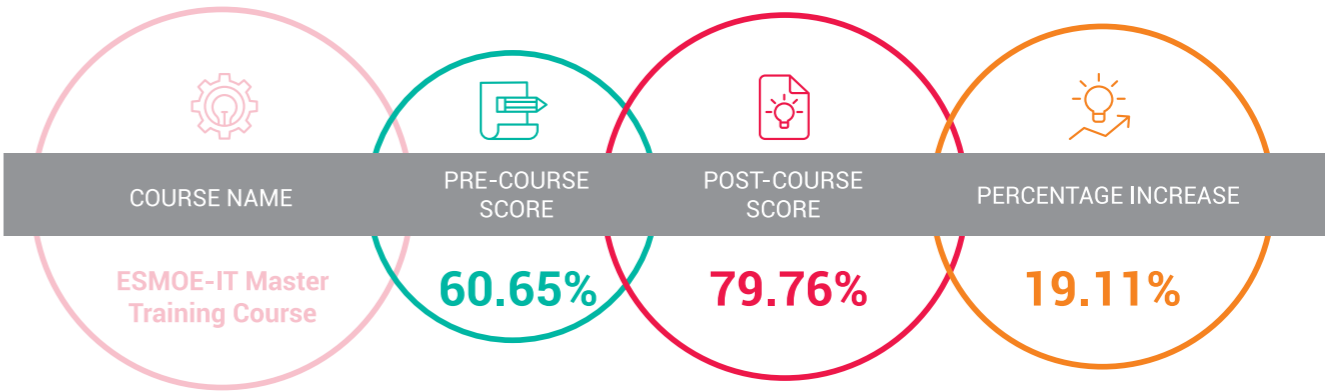
1. EMS Training

Courses that had been completed up to December 2018 were included in the evaluation. In total, 692 people have been trained under the MSD programme..



The analysis of the results from the pre- and post-course assessment found that the average score increased by 19% (Table 7). This indicates that the training was successful in transferring new knowledge to EMS personnel.

Table 7. ESMOE-IT Master Training Course - Pre- and Post-Course Assessment Results



One of the main aims of the Master ESMOE-IT training was to ensure that the delegates who attended the training be declared competent to cascade the training to their own districts, ensuring that the training intervention is sustainable.

The cascaded training in Amathole district and the rest of the Eastern Cape has been very successful, with 868 EMS personnel being trained. Anecdotally, the reason for the success in this province was because the EMS college and the Master trainers worked together in this process. The college has the required manikins and other equipment and made it available to the Master trainers. With the support of the Regional Training Manager, who secured funds for travel and accommodation, the EMS college Master trainers could cascade the training to all districts in the Eastern Cape.

One cascading session has been arranged in Capricorn, Limpopo, but none have been arranged in Mpumalanga. In both of these provinces the EMS colleges are not fully functioning, and the Master trainers do not have access to the required equipment (e.g. birth simulator, resusci baby, etc). This challenge was also highlighted in the interviews conducted with training participants:

'Okay well, what I can say is this training should be for everyone.' *Training participant interview*

'We don't have the proper equipment to teach the others.' *Training participant interview*

In response to this, and with the permission of MSD, FPD purchased equipment at the end of 2018 for the two provinces to cascade the training.

In 2019, FPD will expand the Master Training to OR Tambo and Nelson Mandela Metro districts in the Eastern Cape.

1.2 Short Course in the Management of Obstetric Emergencies In-Transit - BLS Cadre

The training material for the emergency obstetric care for BLS EMS personnel course is based on the ESMOE-IT accredited course and adapted to the roles and responsibilities of the BLS cadre within an ambulance. As of December 2018, 332 BLS personnel had been trained (Table 8).

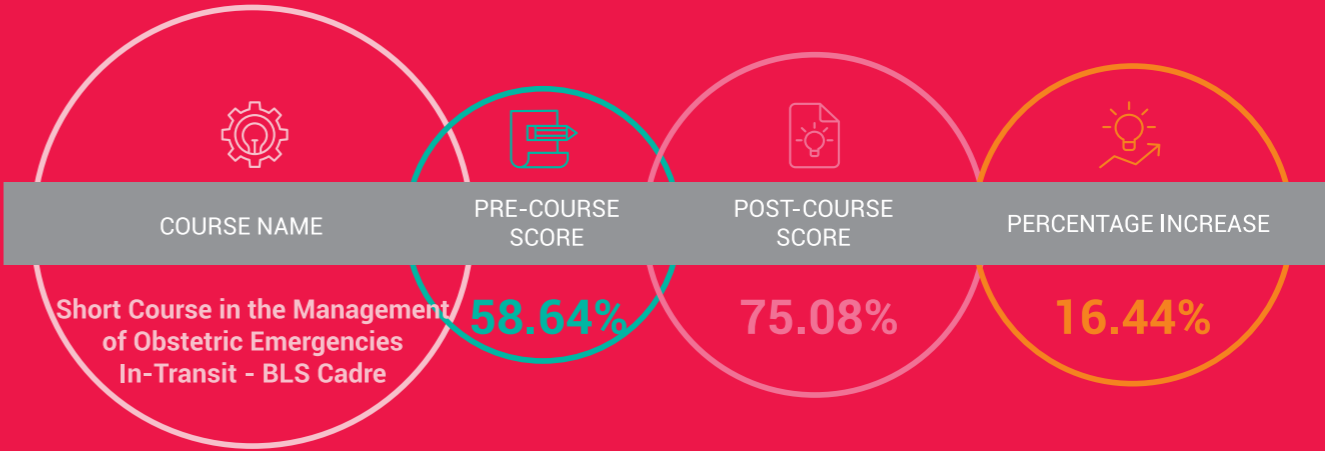
In 2019, FPD will expand the BLS training to OR Tambo and Nelson Mandela Metro districts in the Eastern Cape.

Table 8. Short Course in the Management of Obstetric Emergencies - BLS Cadre - Number of people trained



THE PRE- AND POST-COURSE ASSESSMENTS RESULTS SHOWED THAT THE AVERAGE SCORE OBTAINED BY THE TRAINEES INCREASED BY 16.44% AFTER THE COURSE.

Table 9. Short Course in the Management of Obstetric Emergencies - BLS Cadre - Pre- and Post-course Assessment Results



1.3 Short Course in EMS Call Centre Communications - Obstetric Emergencies

The development of the standardised e-training programme for specialised call centre operators or Emergency Medical Dispatchers (EMD) for obstetric emergencies was developed by an industry expert from Er24. The modules include overall operations management of a call centre; terminology and abbreviations; basic physiology of pregnancy; emergencies in pregnancy; transport modes available (with advantages and disadvantages of each and to include all modes: private, metered taxi, minibus taxi, patient transport vehicle, ambulance, helicopter, fixed wing); call etiquette; code of conduct at the call centre; contact centre call flow; and case handover. While this was an online course, FPD facilitated the course face-to-face due to the lack of access to computers and the internet. This included a facilitator, the provision of laptops, access to the platform, an IT technician from FPD and a representative from Medical Practice Consulting (MPC) (developer and host of online platform). The aim of this was to ensure that a number of individuals in each district are trained on the platform to ensure that they can assist with the cascading of this in the districts. This will allow for easier implementation of the online course across the districts.

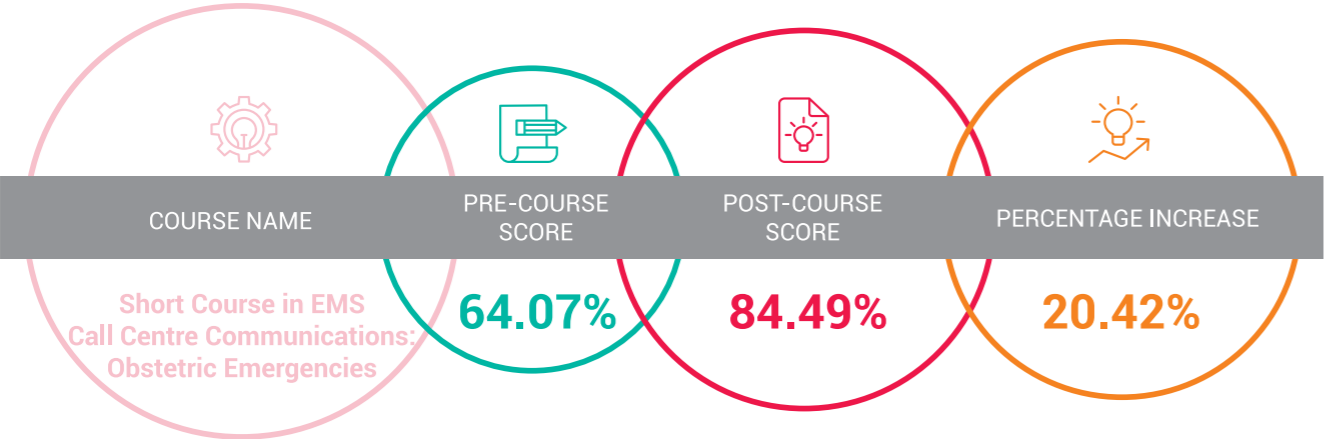
Up until December 2018, 101 Call Centre operators had been trained, five times more than the target (Table 10). In addition to reaching 101 call centre staff members in the five districts where FPD is implementing the project, FPD informed the other provinces in South Africa about the training. As the course is already hosted on the platform, there is no cost implication to the programme from the additional participants, allowing FPD to extend training to the whole country. An additional 101 EMS personnel across the country completed the course. They work in Gauteng, the Free State, the Western Cape, the Northern Cape, Mpumalanga, North West and KwaZulu-Natal.

Table 10. Short Course in EMS Call Centre Communications - Obstetric Emergencies – Number of people trained



The trainees average score for the pre- and post-course assessments increased by 20.42% (Table 11).

Table 11. Short Course in EMS Call Centre Communications - Obstetric Emergencies – Pre- and Post-course Assessment Results



1.4 Positive effect of training on EMS Personnel

Respondents acknowledged that they notice a difference in those who attended the training in terms of their knowledge and ability within the obstetrics field. They also described the overall positive effect on EMS personnel's' confidence, attitude and outlook.

“ ‘College of training in Mpumalanga has been redundant since 2011, so the training has really uplifted people's attitude and they are more hopeful for their career. It has reignited their passion for the profession despite the lack of resources and equipment.’ *District Management Interview*

“ ‘They gained confidence, know what is expected of them when attending to a patient.’ *EMS Survey respondent*

The training participants enjoyed the practical component of the course and found that it enabled them to apply the theory once they were back in the field.

“ ‘Yes, because even though we did maternity at school, it's the way this training is structured. It actually puts you in a position, especially the drills, there's theory and then there's drills. So when you do the drills, the manikins that they have simulate the real situation.’ *District Management Interview*

“ ‘It makes a difference once you've been for training when you're faced with the situation, you remember exactly what transpired in class and you apply that. So for me I think it's a very important course.’ *EMS Training Interview*



THE TRAINING PARTICIPANTS SAID THAT THE TRAINING UPDATED THEIR KNOWLEDGE AND SKILLS, WHICH ALLOWED THEM TO PROVIDE BETTER CARE TO OBSTETRIC PATIENTS.

BECAME MORE AWARE OF THEIR
SCOPE OF PRACTICE

“

'There is some aspects that we did not know properly. So after the training we knew better.' *EMS Training Interview*

'To know the pharmacology about the drug given and secondly as to when to give the drug and how to administer the drug especially when you're en-route, you know, that already is a plus for me.' *EMS Training Interview*

'Additional drugs that were mentioned at training has brought a better understanding of how patients are treated at the facilities although it is not in their scope of work to administer the drugs. Therefore more informed questions are asked.' *EMS Survey respondent*

'We used to assume that (if) the baby is blue, he's dead. Now that they trained us, we know that we must take our stethoscope and use the little side on the baby's heart then thereby you going to find out if there is a pulse.' *EMS Training Interview*

”

The respondents reported that the EMS staff that were trained by FPD passed the knowledge on to their colleagues when they were back at work. This was emphasised as a major positive effect of the programme.

“

'After the training they called for debriefing just to share the information with other staff members.' *EMS Survey respondent*

'Staff members who attended shared with the rest of the team.' *EMS Survey respondent*

”

EMS staff reported that they became more aware of their scope of practice and what questions they should ask the patients, as well as the healthcare facility staff during patient hand-over.



“
‘So before we did this course, we asked questions, but the questions were not so deep. So we wouldn’t reach the real problem. You know you obtain a full history and when you make a call to the receiving hospital, they already know what kind of a maternity patient you’re bringing because of the questions you asked.’ EMS Training Interview

‘Okay, even when the clinic is transferring a patient to the hospital, that patient comes through maternity, you see I know what needs to be done first and what they are saying and what they are not supposed to do before they can refer the patient to the hospital and all the necessary that should be done for that patient before they can transfer that patient.’ EMS Training Interview
”

One Call Centre Communications training participant described a call that she received from a person looking after a mother who had just given birth. The participant was able to give the person on the phone clear instructions as to what they should do while the ambulance was on its way, ‘cover the baby with the clean blanket there, lie the baby on the side, the baby shouldn’t face upward, then the mother should also be on her side’. The participant was able to keep the person on the phone calm, ‘don’t panic, whoever is going to help that person, the patient and the baby should be very calm’. In the end the ambulance arrived, and the mother and baby were healthy.

Respondents felt that the programme had the potential to have an impact on infant and maternal mortality as the quality of obstetrics care provided by those who had been trained improved significantly.

“
‘The standard of care for obstetrics improved after the training. More training is still needed.’ EMS Survey respondent
”

“
‘The programme responded adequately because before staff used to ignore obstetric standards, but after the training they take it more seriously. More staff should be trained.’ EMS Survey respondent
”



2. EMS Stations and Communication Centres

2.1. EMS Stations and Communication Centres visited

Forty-seven facilities were visited in total, 43 EMS Stations and four Communication Centres, an 88% response rate (Table 12). Six EMS stations were either unable to participate in the survey during the time the data collectors were in the district or refused to participate.

Table 12. Number of EMS Stations Visited

District, Province	Number of EMS Stations	Number of Communication/ Call Centres	TOTAL
Amathole, Eastern Cape	3	1	4
Capricorn, Limpopo	10	1	11
Nkangala, Mpumalanga	7	1	8
Ehlanzeni, Mpumalanga	9	0	9
Gert Sibande, Mpumalanga	14	1	15
TOTAL	43	4	47

It must be noted that the figures in this report were reported by the respondent at the EMS station and not verified by the data collection team. .



2.2. EMS Stations - Ambulances

Respondents from EMS stations were asked to indicate the number of functional ambulances that they had on-site. All of the stations had at least one functional ambulance, with most having two (Figure 4).

Most stations had zero obstetric ambulances (74.42%); 18.6% had one obstetric ambulance; 4.65% had two and 2.3% had three (Figure 5).

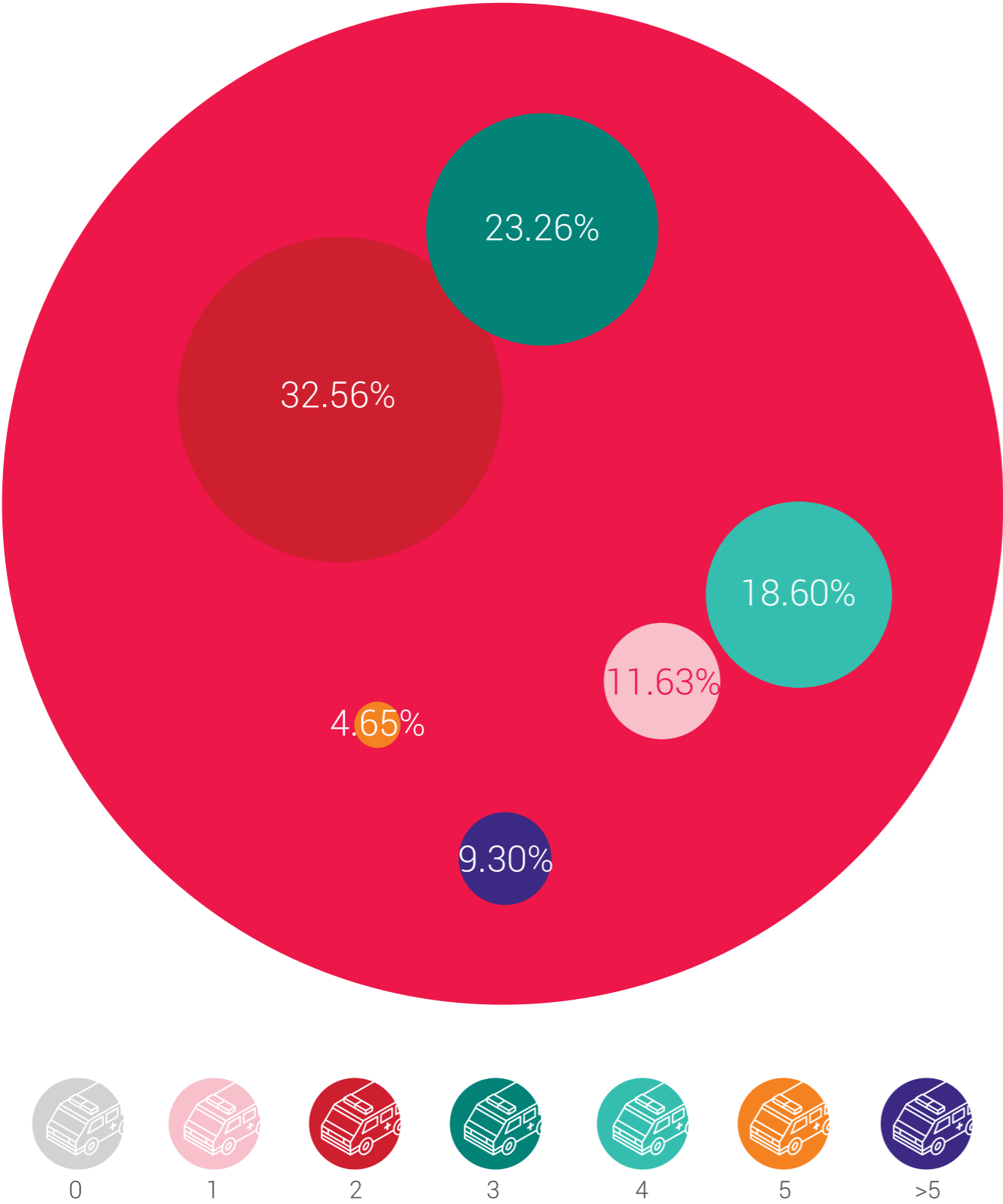


Figure 4. Number of functional ambulances

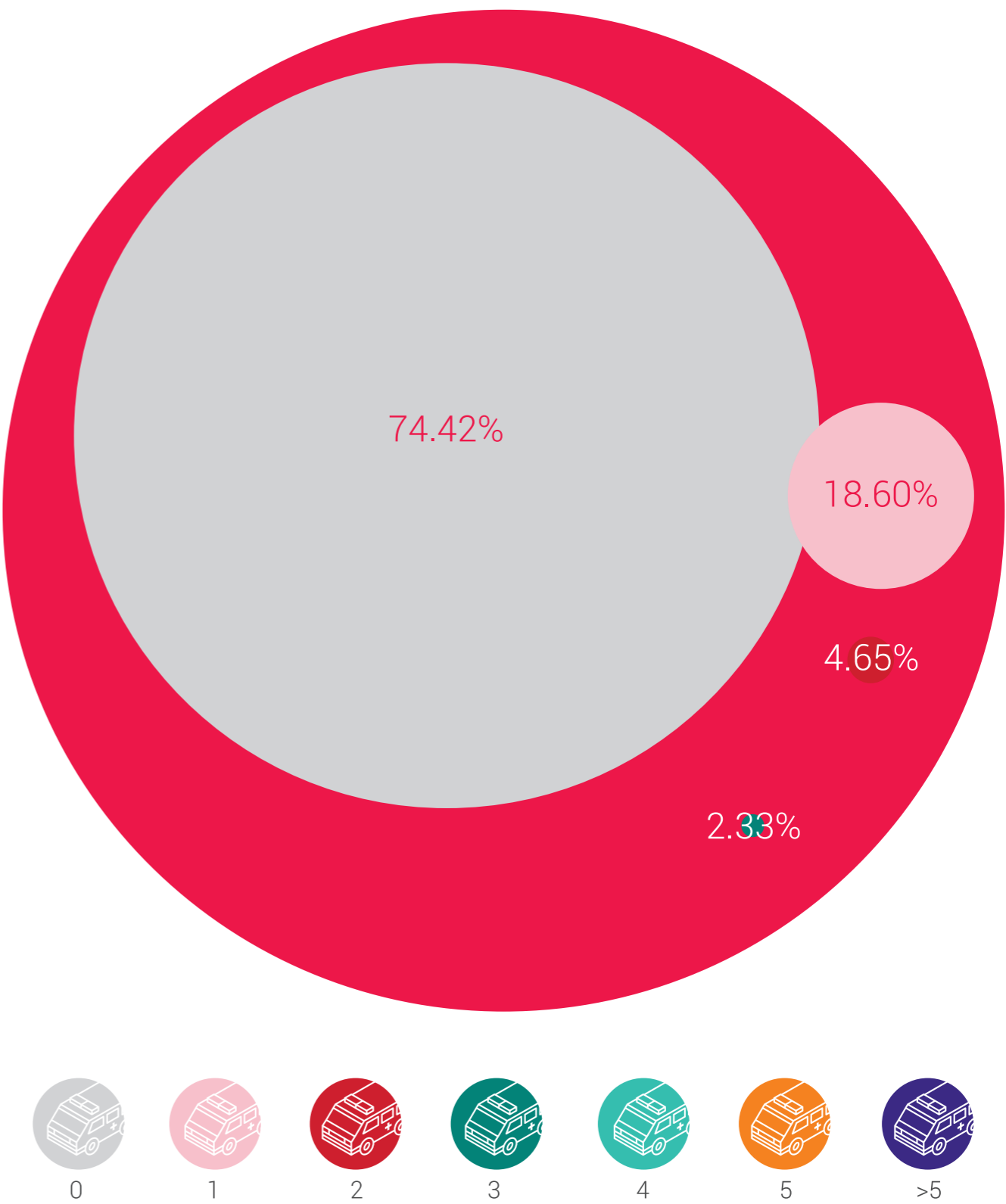


Figure 5. Functional Obstetric Ambulances

When asked 'how often does an emergency need an obstetric ambulance, but none are available?', the majority of respondents (67.5%) reported that it happens 'very often' (Figure 6).

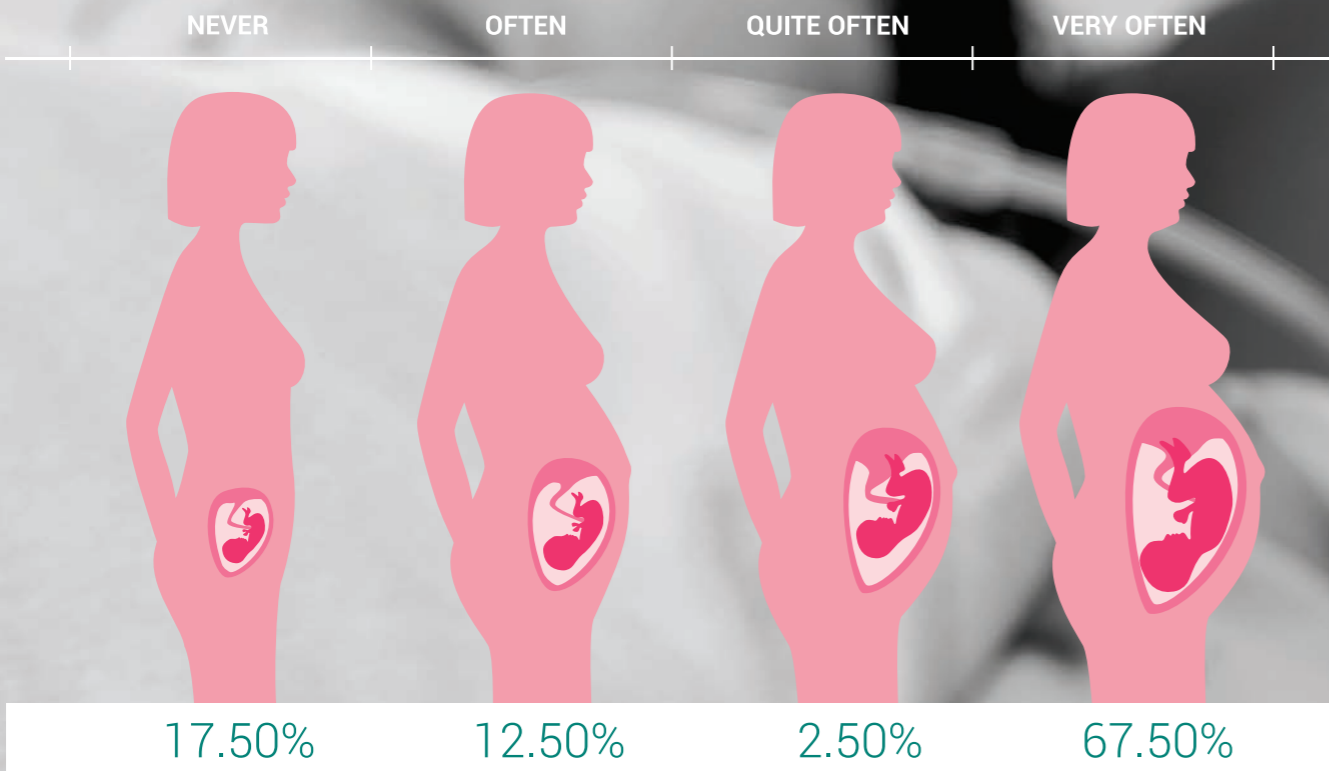


Figure 6. How often does an emergency require an obstetric ambulance, but none are available?



Thirty percent of the stations had zero response vehicles and just over half had one (51.16%) (Figure 7). The remaining 18.6% of stations had two functional response vehicles.

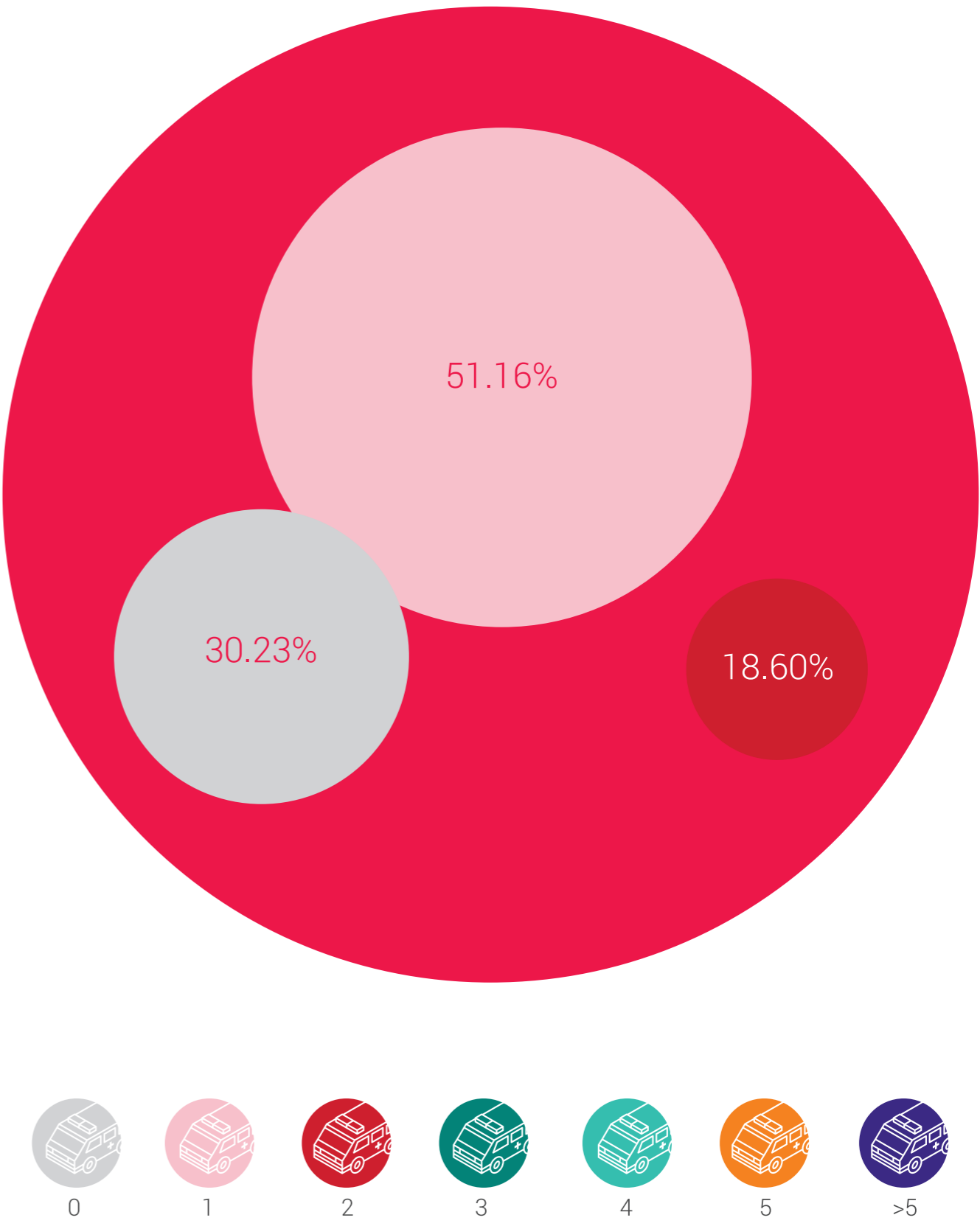


Figure 7. Number of Functional Response Vehicles

Nearly 80% of the respondents reported that ambulances were not well equipped to respond to medical emergencies (Figure 8).

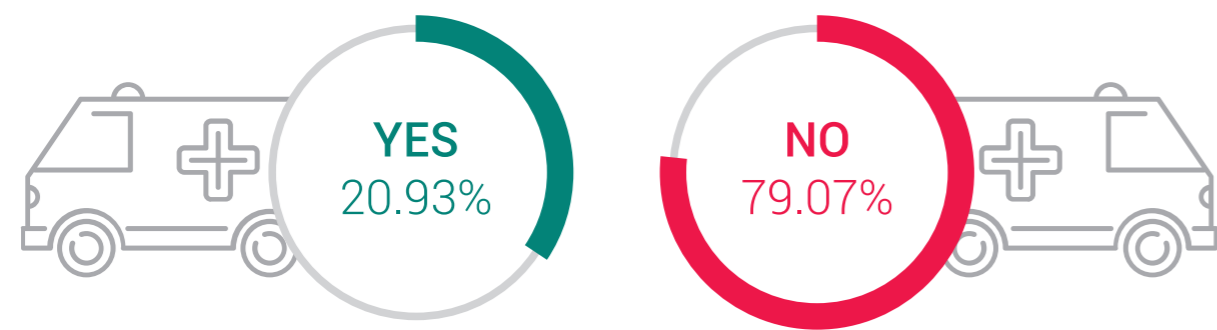


Figure 8. Are ambulances well-equipped to respond to medical emergencies?

The interview respondents highlighted that the shortage of ambulances and lack of equipment severely hampered their ability to provide high-quality EMS:

“

'So they have the skills but now when there's a lack of equipment, they are struggling to implement the new skills.' *Training participant interview*

'The challenges that we've got is equipment, we don't have much equipment. All of the patients, we struggle to assist the patients because we struggle with equipment.' *Training participant interview*

'Like BP machines, we have to provide your own to perform your duty. They don't provide that.' *Training participant interview*

'... you know some of the farms, it's far distances that we've got to travel, we've got shortages of ambulances, we've got shortage of personnel.' *Training participant interview*

”

Table 13 lists the equipment needs reported by the EMS Stations, most commonly vital signs machines, infant incubators, spinal boards, head immobilisers and splints.

Table 13. Equipment needs reported by EMS Stations

EQUIPMENT NEEDED	
Blood glucose test machine	Pulse oximeter
Blood pressure machine	Respiratory monitor
Defibrillators	Resuscitation bags
ECG machine	Spider harness
Head immobiliser	Spinal boards
Infant Incubator	Splints
IV infusion pump	Stethoscopes
Jump bags	Suction pump
Kendrick extraction device	Thermometers
Neck brace	Torches
O-rings for oxygen regulators	Traction splints
Oxygen regulator	Ventilator
Personal protective equipment	Vital signs monitor

2.3. EMS Stations - Staff

In terms of BLS staff, 4.65% of the stations had 1 to 10 BLS personnel, 44% had 11 to 20, 46.5% had 21 to 50 and 4.65% had more than 50 (Figure 9). Most stations (65%) had 11 to 20 ILS staff, 9.3% had 1 to 10 and 23% had 21 to 50 (Figure 9). The majority of stations (72%) had no ALS staff, 27.9% had 1 to 10 (Figure 9). According to the respondents, there are not enough ILS and ALS staff to supervise BLS staff during transit (Figure 10). According to Emergency Medical Services Regulations, BLS staff must be supervised by a senior staff member, however there were almost three times more BLS personnel than ILS and ALS personnel, making this impossible to comply with. It was anecdotally reported that BLS personnel often practice without the supervision of a senior.

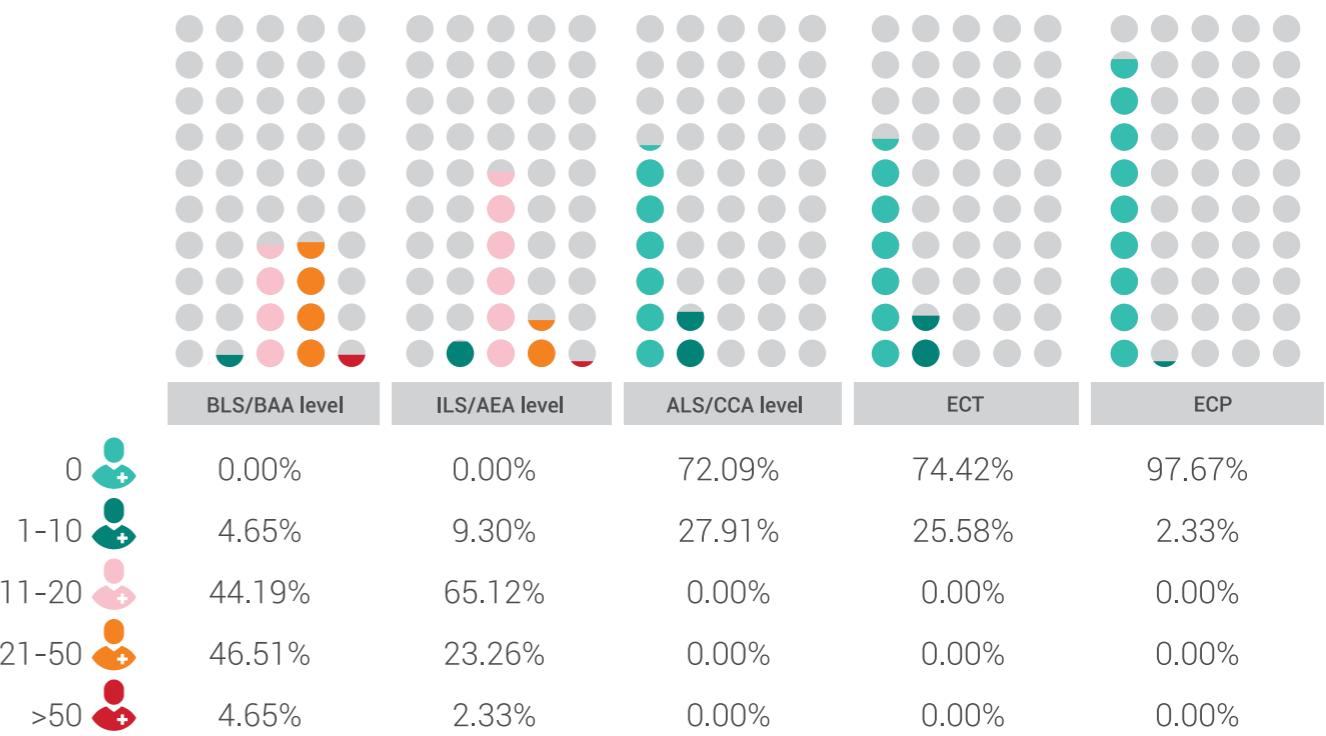


Figure 9. Number of EMS staff per cadre

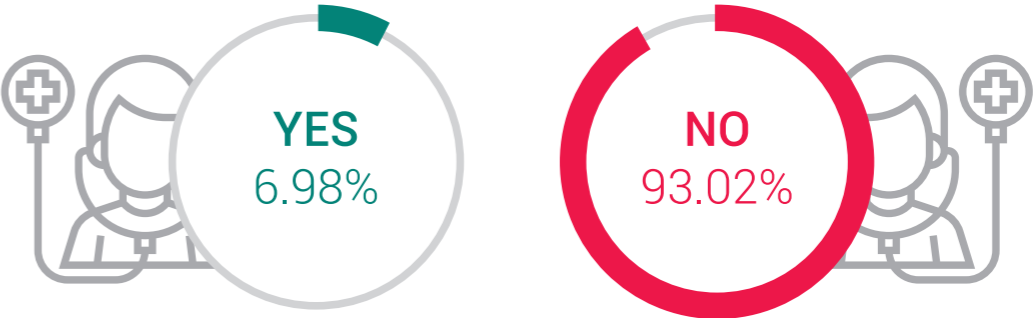


Figure 10. Are there sufficient ILS and ALS staff to supervise the BLS staff during transit?

2.4. EMS Stations - Communication

On average, stations had 1.3 operational landlines. Eight stations (18.6%) have no operational landline. Just over half of the stations (53.49%) had at least one operational landline, 16.28% had two operational landlines, 6.9% had three and 4.65% had four (Figure 11).

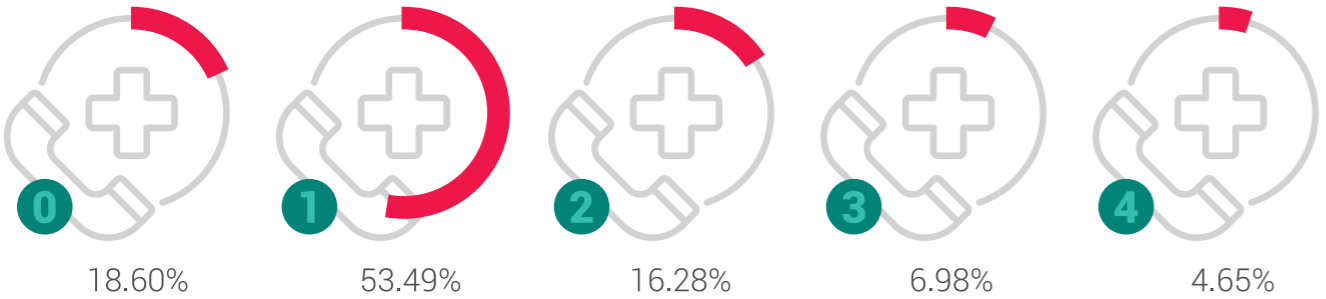


Figure 11. Number of operational landlines

Under half of the ambulances (44.91%) based at the stations that were surveyed have a two-way radio that works (Figure 12).

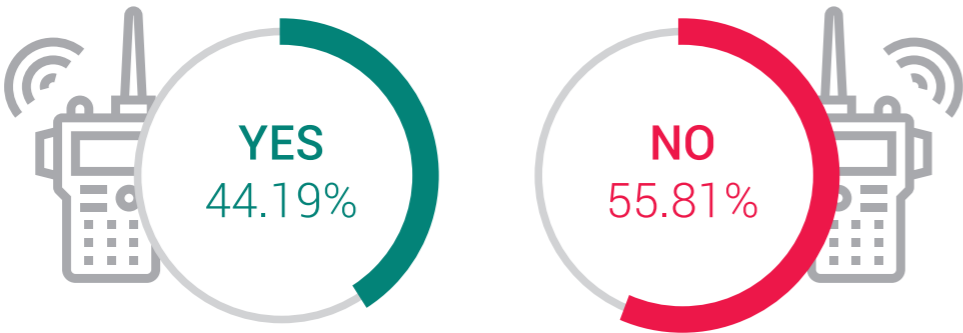


Figure 12. Is each ambulance based at this facility fitted with a two-way radio that works?

The majority of respondents (95.35%) reported that staff use their personal cellphones to communicate with each other, the call centre and their supervisors (Figure 13). Other means of communication that were reported include WhatsApp (13.95%), PTT (23.26%) and TETRA Radio (4.65%) (Figure 13).

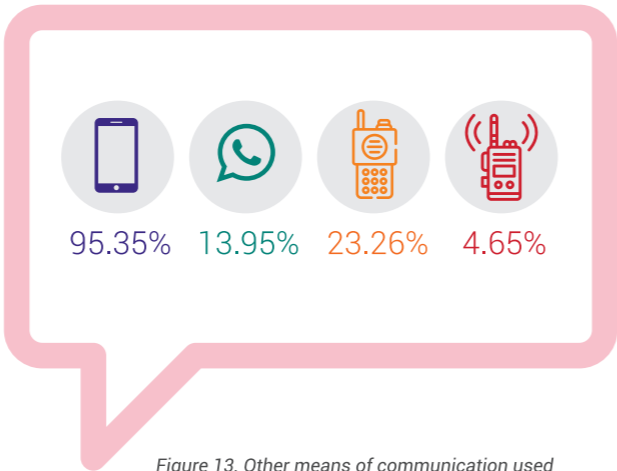


Figure 13. Other means of communication used

2.5. EMS Stations - Response interval

The average response interval refers to the time between the ambulance being dispatched and arriving on the scene. This time is dependent on the location of the incident, whether it is in a rural or urban area, and the distance to the incident.

FIGURE 14 SHOWS THAT THE MAJORITY OF STATIONS (23.26%) REPORTED AN AVERAGE DISPATCH INTERVAL OF 31 TO 60 MINUTES.

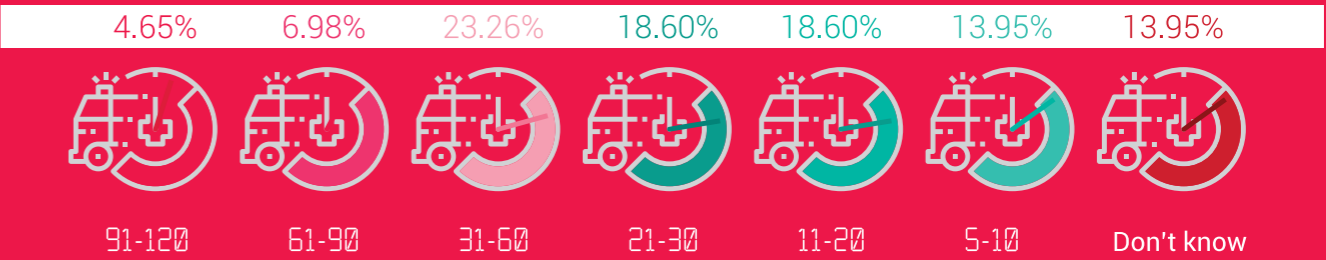


Figure 14. Average Response Interval (minutes)

REASONS FOR
**INTER-FACILITY
TRANSFERS**

2.6. EMS Stations - Inter-facility transfer

The inter-facility transfer time refers to the time it takes to transfer a patient from one health facility to another. The results indicate that the average inter-facility transfer time was between 30 and 60 minutes for the majority of stations surveyed (44.19%) (Figure 15). As above, the time depends on the location of and distance between the facilities. Respondents were asked to indicate the four most common reasons for inter-facility transfers for obstetric emergencies; high blood pressure was reported in 83.72% of stations, followed by pre-term labour and haemorrhage. Delayed labour and fits and convulsions were both reported in 55.81% of stations (Figure 16).

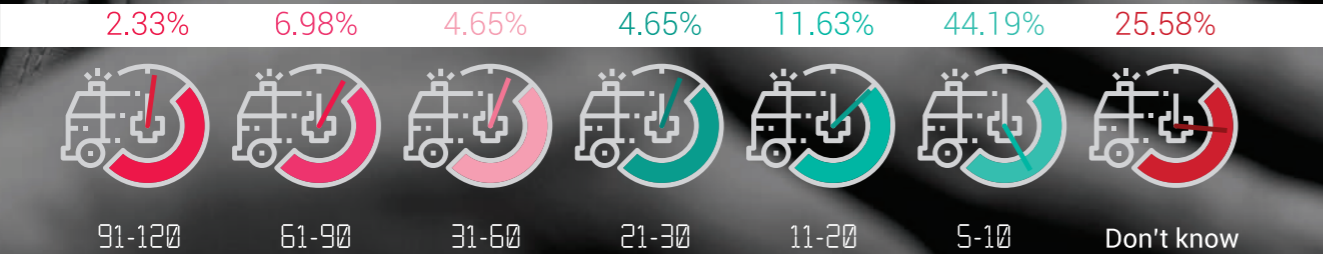


Figure 15. Average inter-facility transfer time (minutes)

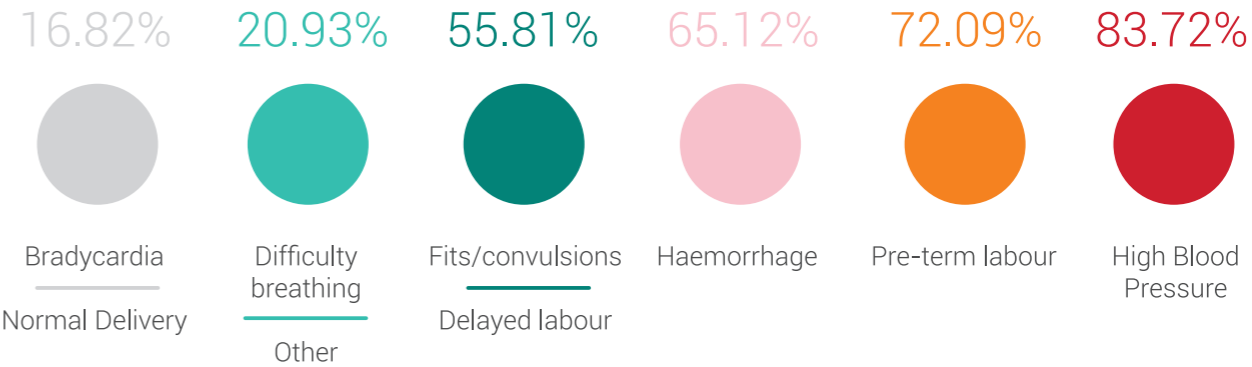
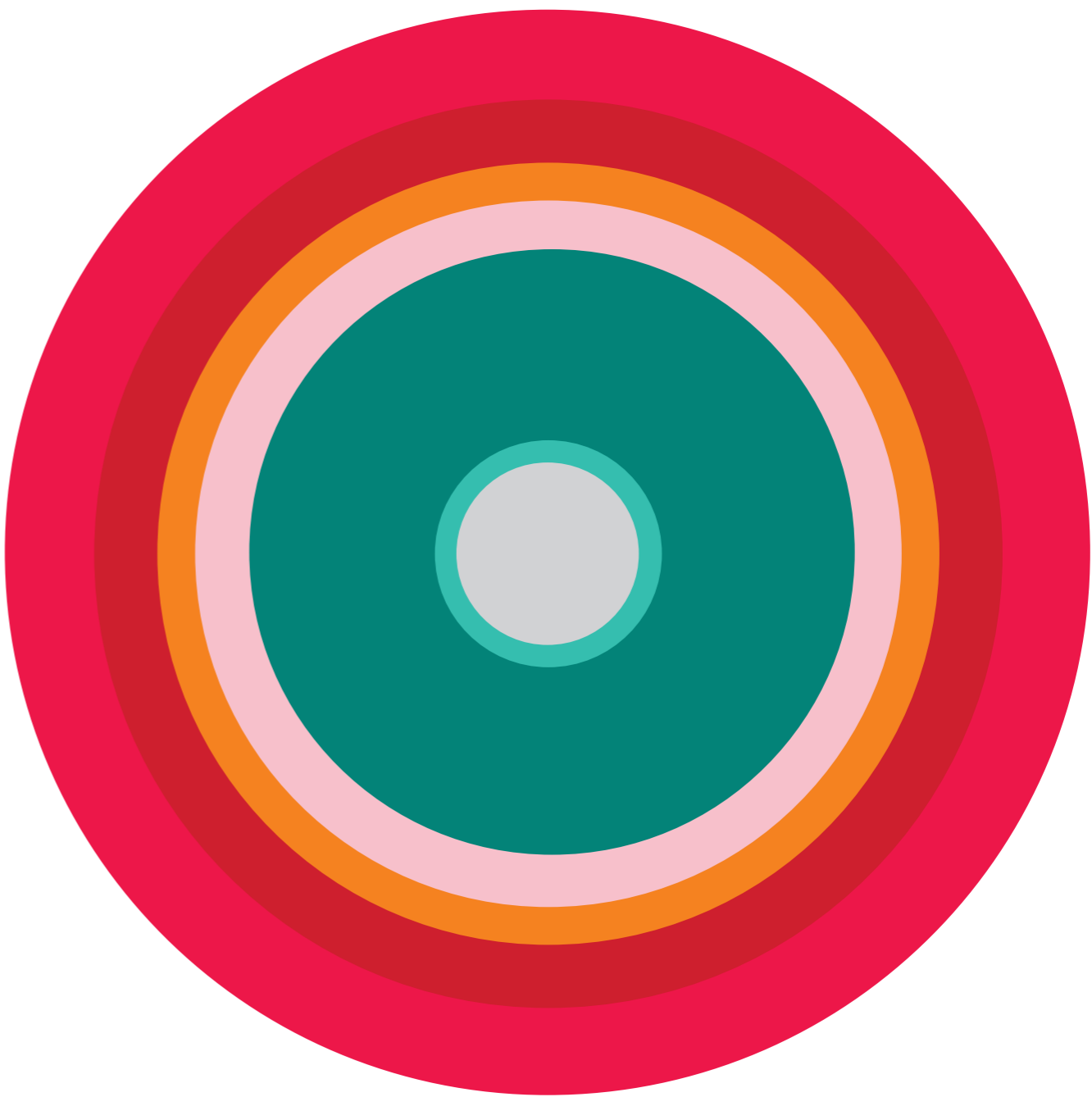


Figure 16. Reasons for inter-facility transfers for obstetric emergencies

2.7. EMS Stations - Standard Operating Procedures (SOP)

THE SECOND OBJECTIVE OF THE MSD PROGRAMME WAS TO WORK WITH THE NDOH TO STANDARDISE AND ROLL-OUT PUBLIC SECTOR EMS CALL CENTRE PROTOCOLS, CLINICAL CARE PROTOCOLS, SOP's AND MONITORING TOOLS FOR OBSTETRIC EMERGENCY INTER-FACILITY TRANSPORT SERVICES.

FPD handed these over to NDOH in October 2018. *Figure 17* shows the SOPs that respondents indicated were available at the EMS Station. Only 23.26% of the stations reported that they have an SOP on obstetrics (*Figure 17*). It must be noted that at the time of developing this report, NDOH was still in the process of sharing the SOPs with the provinces.

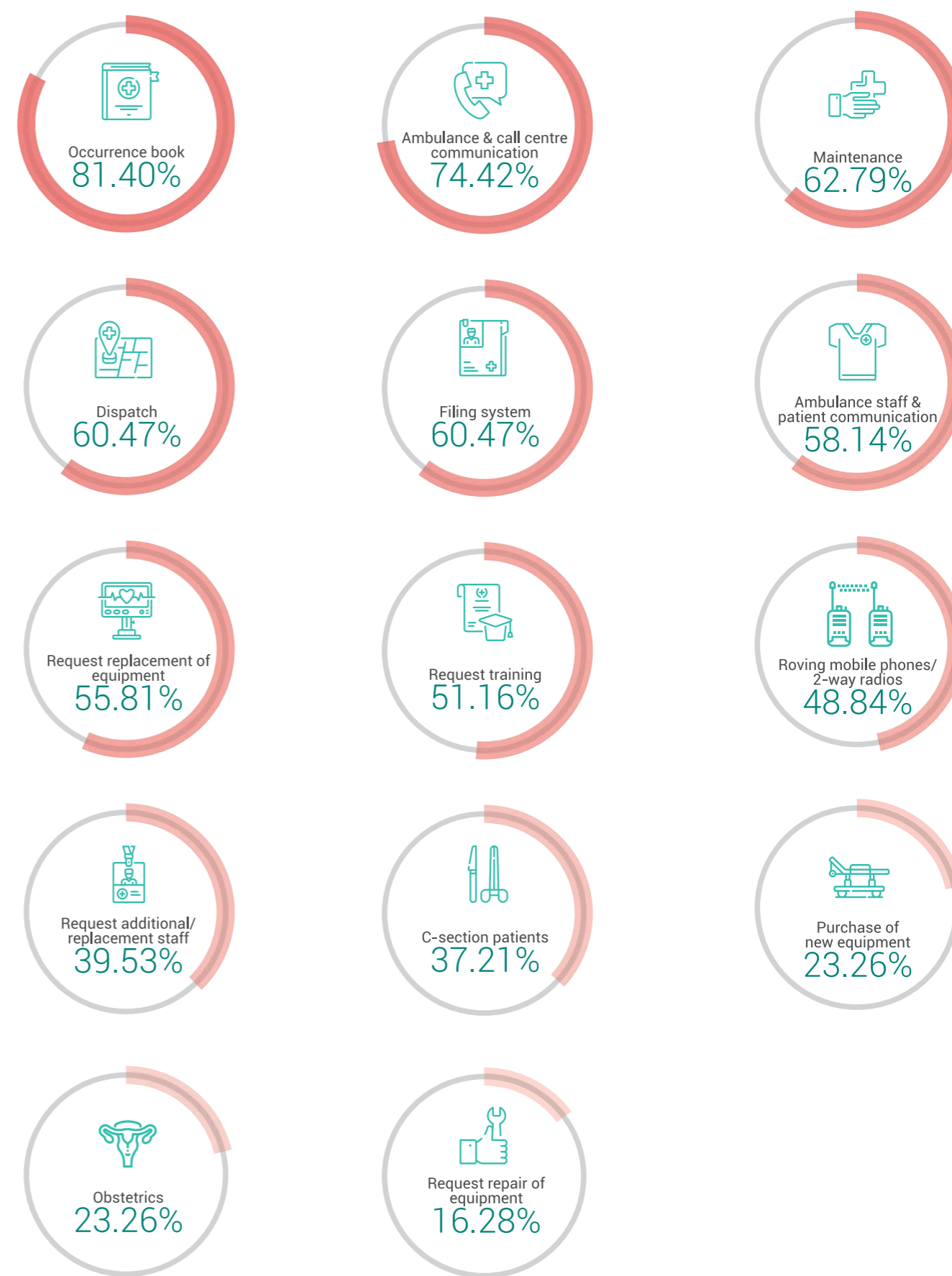


Figure 17. SOPs available at EMS Stations

2.8. EMS Stations - Birth Before Arrival

Birth Before Arrival (BBA) is the term referring to births that occur either at home or in transit before the mother reaches a health facility. BBA is a preventable phenomenon; however, it still commonly occurs despite progress made in obstetric care²⁰.

The total number of babies born before arrival in the last 12 months reported by the 47 EMS stations was 1004. Of these, 219 (21.8%) had complications.

Figure 18 a shows that the majority of stations (34.88%) reported that between 1 to 10 babies were born before arrival in the last 12 months and Figure 18 b that between 1 and 10 had complications. It must be noted that these figures were reported by the respondent at the EMS station, and not verified by the data collection team. Districts where the most BBAs were reported were Capricorn and Ehlanzeni.

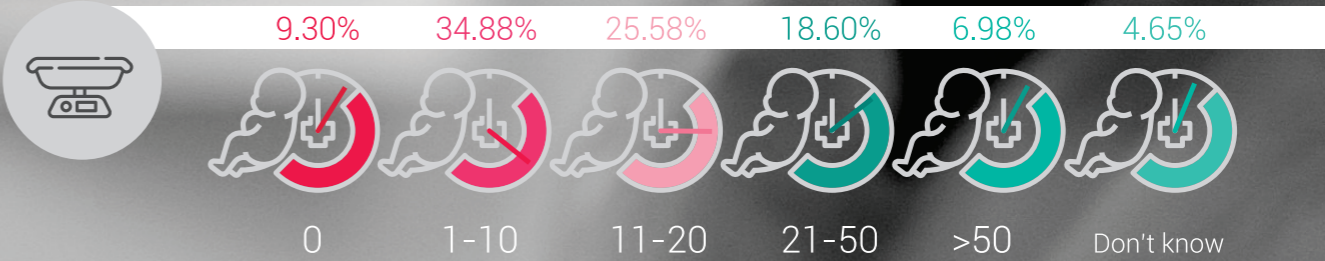


Figure 18 a. Babies born before arrival

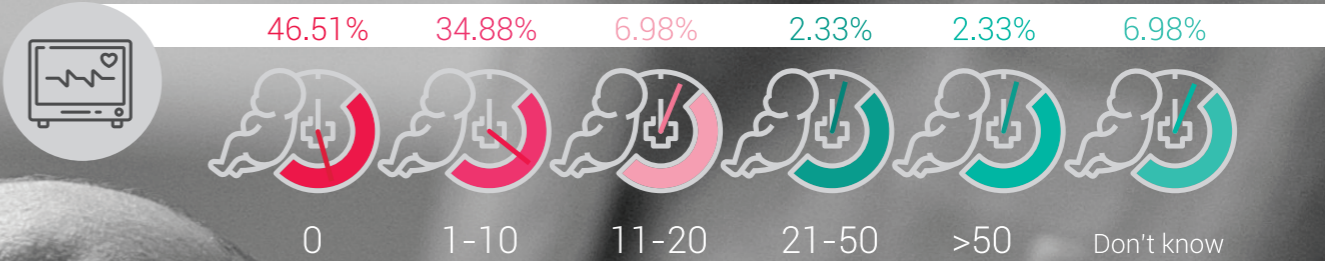


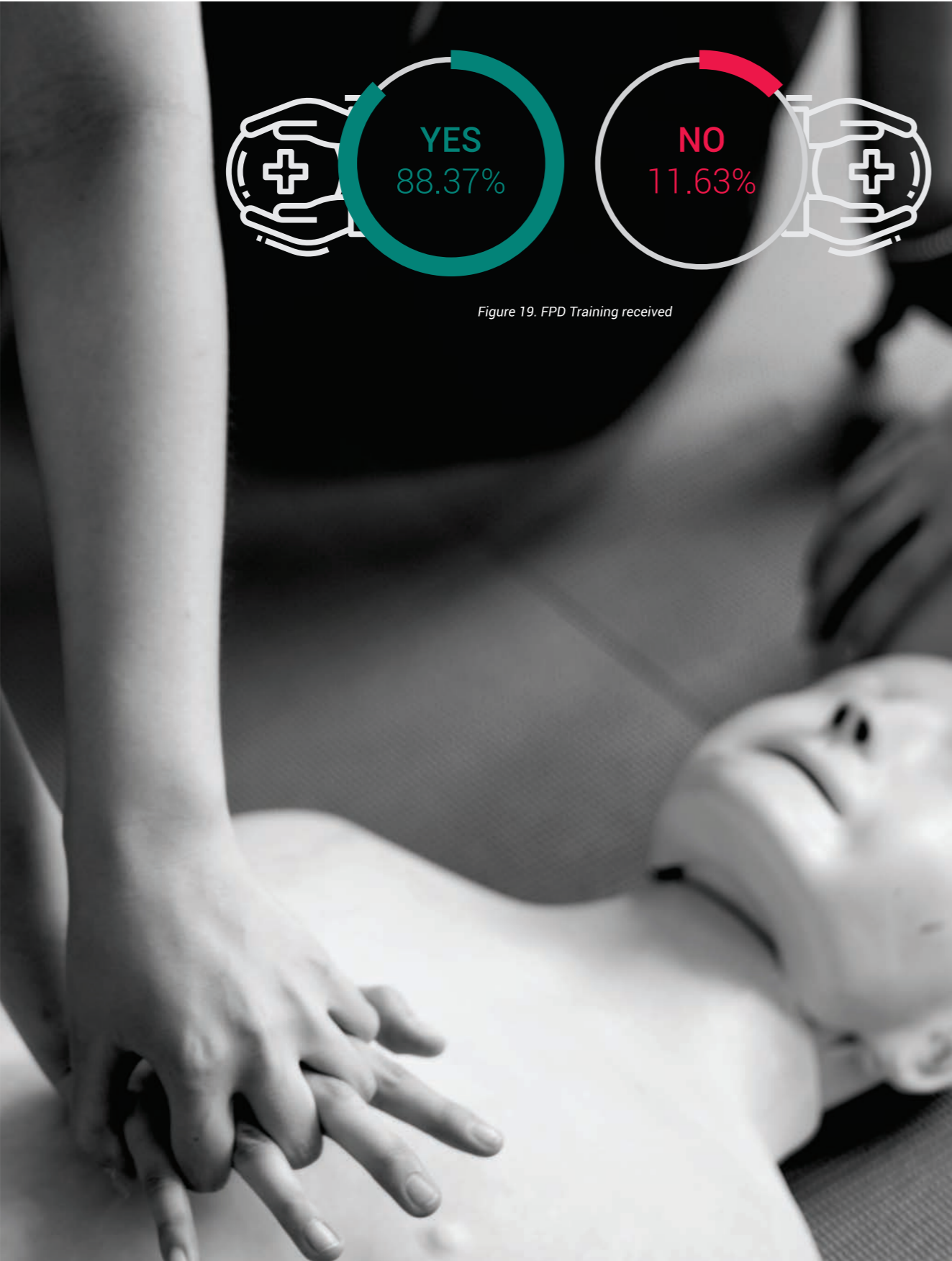
Figure 18 b. Babies born with complications



²⁰Khupakonke S, Beke A, Amoko D. 2017. Maternal characteristics and birth outcomes resulting from births before arrival at health facilities in Nkangala District, South Africa: a case control study. BMC Pregnancy and Childbirth 17:401. DOI 10.1186/s12884-017-1580-5

2.9. EMS Stations - Training

In December 2017 only 30% of EMS stations in the five districts reported that some of their staff had received training in managing obstetric emergencies in transit. This data was obtained to inform the implementation of the training. Twelve months later 88.37% of EMS Stations indicated that staff at their facility had received the obstetrics training from FPD (either the ESMOE-IT Master course, ESMOE-IT BLS Cadre Course or the EMS Call Centre Communications for Obstetric Emergencies Course) (Figure 19).



2.10. EMS Station Survey Summary Table (Per District)

Table 14. EMS Station Summary Table Per District

	Amathole, Eastern Cape	Capricorn, Limpopo	Nkangala, Mpumalanga	Ehlanzeni, Mpumalanga	Gert Sibande, Mpumalanga	TOTAL
Number of stations visited	3	10	7	9	14	43
Ambulances						
# of Functional Ambulances	12	43	27	21	31	134
# of Functional Obstetric Ambulances	5	2	2	4	2	15
# of Functional Response Vehicles	5	1	6	9	17	38
Staff						
Total	165	321	216	167	313	1182
# of BLS	116	201	167	131	211	826
# of ILS	48	116	36	30	61	291
# of ALS	1	3	8	2	31	45
# of ECT	0	1	5	3	5	14
#of ECP	0	0	0	1	5	6
Communication						
Number of operational landlines	3	21	4	13	13	54
% of ambulances with two-way radio	66.67%	20.00%	42.86%	77.78%	35.71%	44.19%
% of stations where personal cell phones are used	100%	80.00%	100%	100%	100%	95.35%
% of calls related to obstetrics	unknown	53.85%	44.44%	48.39%	48.39%	48.39%
Average dispatch interval	30	unknown	60	20	20	36.70
Average Response Interval (minutes)	80	38	41	41	23.60	44.72
Inter-facility transfer time (minutes)	30-120	30-60	30-240	30-240	30-180	30-240
SOP's						
% of stations who received updated SOP's	66.67%	30.00%	42.86%	11.11%	35.71%	32.56%
Born Before Arrival						
# of babies BBA	35	312	142	345	170	1004
# of babies BBA with complications	11	95	24	79	10	219
% of BBA with complications	31.43%	30.45%	16.90%	22.90%	5.88%	21.81%
Training						
% of stations that received FPD training	100%	80.00%	100%	88.89%	85.71%	95.35%
# of EMS personnel*	17	84	31	54	84	270

*These were reported by the stations visited, not obtained from FPD's training database.

2.11. Communication Centres

Each Communication Centre had between 20 and 40 staff members, the majority of whom are BLS personnel (Figure 20).

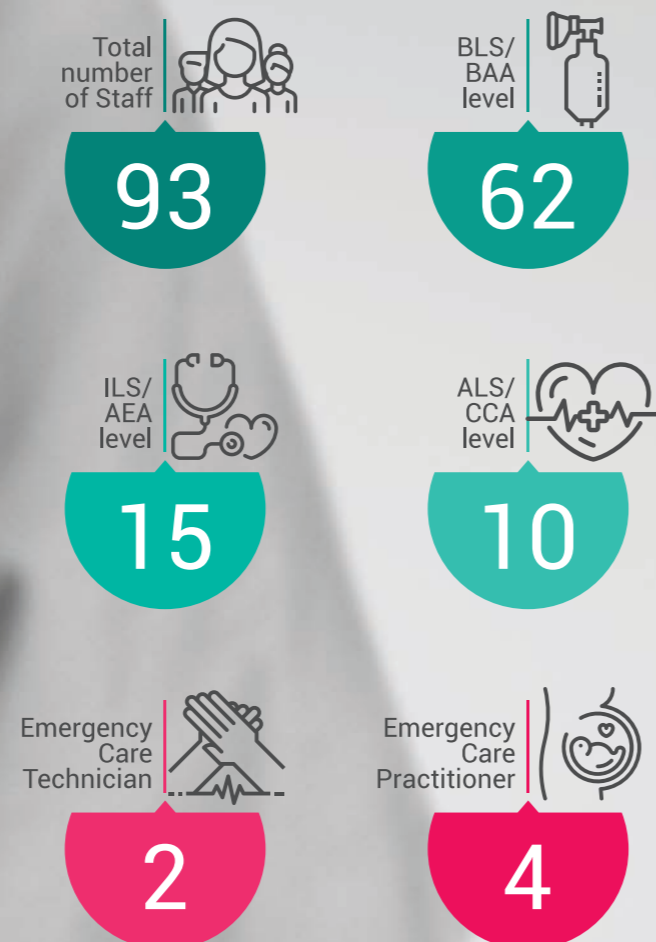


Figure 20. Number of Staff at Communication Centres

EACH COMMUNICATION CENTRE HAD AT LEAST FIVE OPERATIONAL LANDLINES. THE COMMUNICATION CENTRES WHO PARTICIPATED IN THE SURVEY WERE ASKED HOW MANY OF THE CALLS RECEIVED IN THE 24 HOURS WERE RELATED TO OBSTETRICS. FIGURE 21 SHOWS THAT ALMOST 50% OF THE CALLS WERE RELATED TO OBSTETRIC EMERGENCIES.



Figure 21. Number of calls received in last 24 hours related to obstetric emergencies

The average dispatch interval refers to the time between the call being received and an ambulance being assigned to the incident. The average dispatch interval for obstetric emergencies reported by the call centres was 36.7 minutes. It was noted that the dispatch interval depends greatly on the nature of the incident and the availability of ambulances in the area.

It was anecdotally reported that the communication centres are using very old computers which are slow and don't always work. They often have to rely on paper-based systems, which are less efficient than electronic systems.

3. Discussion of Findings

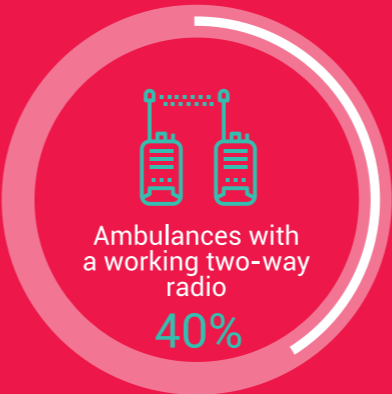
The MSD programme, implemented by FPD between 2016 and 2019, provided training to 692 emergency care personnel in the Eastern Cape, Mpumalanga and Limpopo provinces of South Africa. The results of the evaluation found that knowledge increased significantly (between 16% and 20% on average) among those who attended the training.

Training participants found the training to be extremely valuable and said that it improved the care that they were able to provide to obstetrics patients. Significantly, the training improved ability of EMS personnel to ask the right questions of patients, obtain a full history from them and hand over the patient properly. It also gave them the knowledge and confidence to discuss the patients' treatment and care with the healthcare workers in the transferring and receiving facilities. Trainees highlighted that they know more about obstetrics and the responsibilities of the various role-players during the transport of an obstetrics patient.

The EMS system is still faced with a number of challenges, including a shortage of obstetric ambulances, and essential and obstetric equipment. There was a severe shortage of obstetric ambulances found in the districts surveyed, with 74% of the EMS stations having no functioning obstetric ambulance. Obstetric patients in these cases are transported in general ambulances, which do not have the equipment needed to respond to an obstetric emergency. Most, 80%, of the EMS stations reported that their ambulances are not well-equipped to respond to medical emergencies. Interview respondents reported that EMS personal often bring their own equipment (e.g. blood pressure machines) to work in order to do their job. A number of respondents were concerned that the impact of this programme would not be felt if the other challenges faced are not addressed.



A NUMBER OF COMMUNICATION CHALLENGES WERE ALSO FOUND. ONLY 44% OF AMBULANCES BASED AT THE STATIONS SURVEYED HAD A TWO-WAY RADIO THAT WORKED. WITHOUT THIS, PERSONNEL HAVE TO USE THEIR PERSONAL CELL PHONES AND WHATSAPP TO COMMUNICATE WITH THE COMMUNICATION CENTRE AND THEIR COLLEAGUES.



4. Limitations



Every attempt was made by the evaluation team to conduct the survey in every EMS Station/Communication Centre in the five districts, however six EMS stations were either unable to participate in the survey during the time the data collectors were in the district or refused to participate.



The findings of the survey and interviews are based on self-reporting by the respondents. The data collected was not verified by the data collection team.



Efforts were made to include all relevant officials from district and provincial government in the interviews, however due to time and logistical constraints, it was not always possible. Sampling was thus based on convenience.

No patients of EMS services were interviewed. This is a limitation with regards to the experience of patients who received emergency obstetric medical care.

FINDINGS WERE BASED ON
SELF-REPORTING

4

Recommendations



RECOMMENDATIONS

01

The sustainability and impact of this programme would reach its full potential if more EMS personnel could undergo the training. Cascaded training is more cost-effective than traditional training models, with the potential to reach many more individuals. The success of the cascaded training in the Eastern Cape shows that it is possible to implement cascaded training successfully, if the key stakeholders (e.g. EMS training colleges, Regional Training Managers, District Coordinators, Master Trainers, etc.) work together and are provided with the resources needed. It is recommended that NDOH explore strategies to train Master trainers in the other six provinces in South Africa and cascade this training to all districts.

02

It is recommended that NDOH utilise the same Master Training Course that was developed by FPD as this has been found to be effective. FPD learnt valuable lessons during the implementation of this programme, which should be taken note of for future implementation. For example, it is essential that the selection of master trainers should take into consideration who shows a commitment to the objectives of the training programme.

03

The NDOH needs to facilitate the ability of EMS personnel to provide high-quality emergency medical services. New equipment should be procured to replace old and missing ambulance equipment. If EMS personnel are expected to provide obstetric care, the shortage of obstetric equipment (e.g. incubators, infant warming blankets, etc.) should be addressed. Old and broken ambulances should be replaced.

04

The NDOH needs to address the high number of BLS personnel in relation to their scope of practice and need for supervision, especially in the face of the phasing out of BLS, ILS and ALS cadres.



MORE EMS PERSONNEL MUST
**UNDERGO
TRAINING**



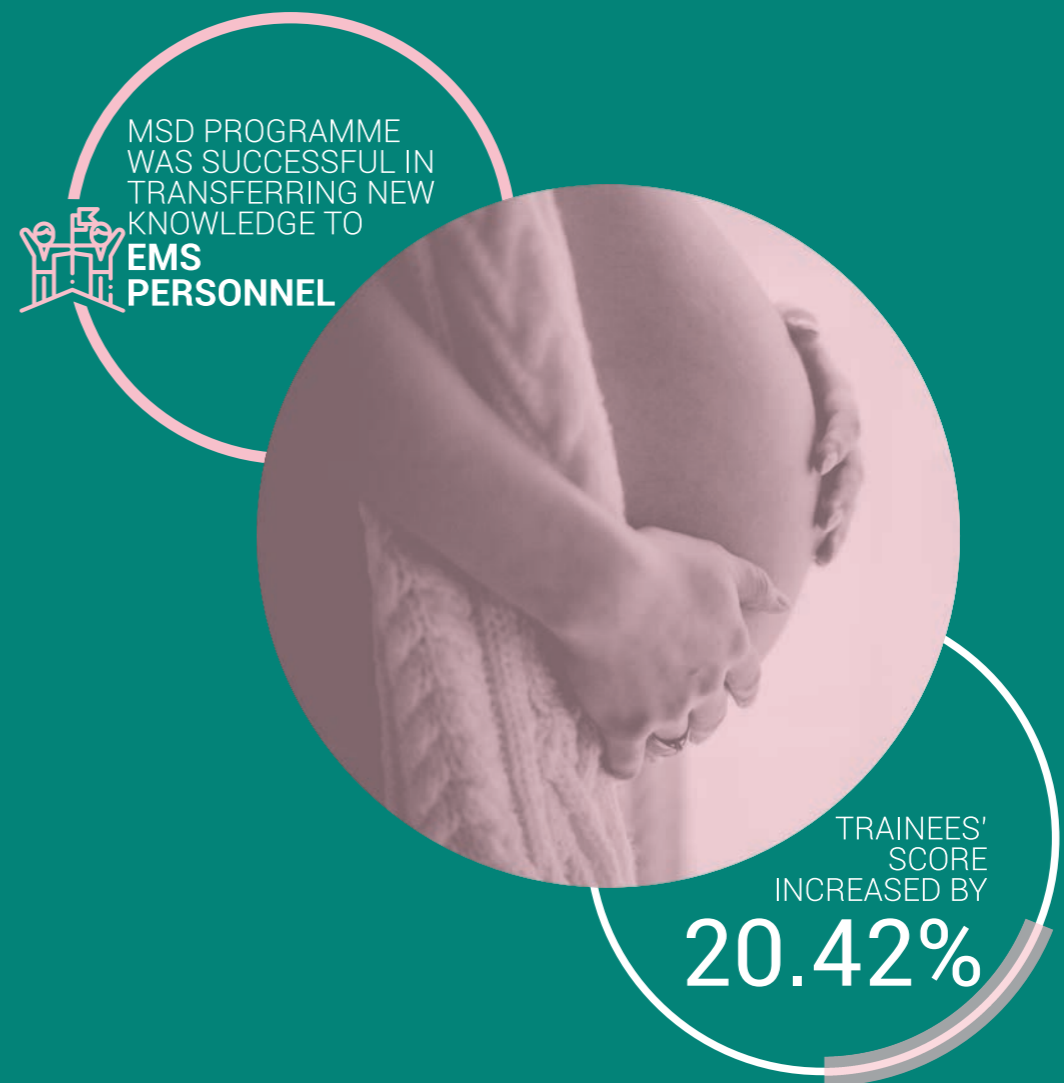


IT IS RECOMMENDED THAT FURTHER RESEARCH BE CONDUCTED ON THE EFFECTIVENESS AND IMPACT OF THE PROGRAMME ON BEHAVIOUR CHANGE AT GRASS-ROOTS LEVEL AND ON INDICATORS SUCH AS MATERNAL MORTALITY.

INDICATORS OF
**MATERNAL
MORTALITY**

5

Conclusion



CONCLUSION

The evaluation of the MSD for Mothers Programme found that the programme met its objective to train communication centre and EMS personnel to provide high-quality, standardised care and management of obstetric emergencies in transit. The potential for this programme to have a significantly positive impact on maternal and infant mortality was highlighted by the beneficiaries and stakeholders, provided that the challenges still faced by the EMS system are also addressed.

OBSTETRIC EMERGENCIES IN TRANSIT



Annexures

ANNEXURE 1: PROGRAMME LOGIC MODEL

IMPACT	Emergency care services provided to pregnant mothers and new born babies during ambulance transit is improved thereby improving maternal and infant survival		
INTENDED RESULTS & OUTCOMES	IR 1: Strengthened Provincial and National EMS systems for obstetric emergencies	# of provinces and districts who adopted standardised SOPs and monitoring system # of provinces supported with trained EMS practitioners Average inter-facility transit time	Data sources: ✔ Situational Analysis ✔ Evaluation
	IR 2: Improved ability of call centre personnel to dispatch calls for obstetric emergencies	Mean dispatch interval # Ambulances dispatched/hour # of participants with improved knowledge, skills and competence	Data sources: ✔ DHIS ✔ Situational Analysis ✔ Evaluation
	IR 3: BLS, ILS and ALS personnel are able to provide high quality care and management of obstetric emergencies according to their scope of practice	# of participants with improved clinical knowledge, skills and competence	Data sources: ✔ DHIS ✔ Situational Analysis ✔ Evaluation
	IR 4: Training Programme is fully adopted by SA Government	# of provinces and districts who have fully adopted the training programme	Data sources: ✔ Evaluation
OUTPUT	1.1 Standardised SOPs available for Obstetric Emergency Medical Services 1.2 Standardised monitoring data collection systems developed	# of monitoring data collection tools developed # of SOPs developed	Data sources: ✔ Evaluation
	2.1 High quality, tailor-made training material developed 2.2 Improvement of call centre operations and standardised EMS operator scripts 2.3 Call centre personnel trained through e-platform	# of call centre supervisors trained # of call centre operators trained	Data sources: ✔ Training platform database
	3.1 High quality, tailor-made training material developed 3.2 BLS, ILS and ALS personnel trained on ESMOE-IT	# of BLS trained on ESMOE-IT # of ALS trained on ESMOE-IT # of 'Master' training courses conducted # of Master Trainers deemed competent # of BLS personnel reached per Master Trainer	Data sources: ✔ Training attendance registers
	4.1 Training programme is integrated into SA Government plans and budgets	# of provinces and districts that have integrated ESMOE-IT & Call Centre training into their annual budget.	Data sources: ✔ Evaluation
ACTIVITIES/ PROCESSES	Update health services data collection tools. Standardise EMS call centre protocols. Standardise EMS clinical care protocols. Standardise and quality assure SOPs (shift changes, staffing guidelines).		
	Training of call centre operators and supervisors through e- learning platform. Training of EMS staff (BLS, ILS and ALS) on ESMOE-IT		
	Promote programme through roadshows Liaise and consult with NDOH.		
INPUTS	MSD funding Existing EMS call centre operator scripts for maternal emergencies. Existing data collection tools	Expert technical advice Training material	

ANNEXURE 2: SCOPE OF PRACTICE²¹



The below list of capabilities and medications must be read in conjunction with the Clinical Practice Guidelines. Where additional interventions and medications are indicated below, the colour key below indicates the mandatory activity that must be undertaken prior to any registered persons performing an intervention or administering any medication previously not on the scope of practice. Where the skill/medication is used in the absence of such activity, providers will be seen to be acting outside of their scope of practice.

²¹ HSPCA. 2018. Clinical Practice Guidelines: Annexure A List of capabilities and medications.



Approved PBEC-CPD Activity without formal assessment.
Where a skill is involved, this may involve practical performance
of the skill.

Approved PBEC-CPD Activity with formal assessment.
Where a skill is involved, this may involve practical performance
of the skill.

CAPABILITY	CATEGORY OF REGISTRATION					
	BAA	AEA	ECT	ECA	ANT	ECP
AIRWAY MANAGEMENT						
Basic manual airway manoeuvres	✗	✗	✗	✗	✗	✗
Suctioning of the airway - upper	✗	✗	✗	✗	✗	✗
Suctioning of the airway - endotracheal					✗	✗
Suctioning of the airway - extraglottic				✗	✗	✗
Manual airway obstruction manoeuvres (conscious choking patient)	✗	✗	✗	✗	✗	✗
Use of Magill's forceps/equivalent			✗	✗	✗	✗
Oropharyngeal airway insertion	✗	✗	✗	✗	✗	✗
Nasopharyngeal tube airway insertion	✗	✗	✗	✗	✗	✗
Endotracheal intubation facilitated by induction, Neuromuscular blockade, mechanical ventilation and airway adjuncts						✗
Endotracheal intubation - non-drug facilitated or via deep sedation techniques	NOT TO BE PERFORMED					
Video laryngoscopy						✗
Supraglottic/extraglottic airway devices insertion (ca - cardiac arrest)			✗	CA ✗	✗	✗
Oro/nasogastric tube insertion			✗		✗	✗
Needle cricothyroidotomy		✗	✗	✗	✗	✗
Surgical cricothyroidotomy (adoloscent/adult) Commercial device recommended			✗		✗	✗

HSPCA. 2018. Clinical Practice Guidelines: Annexure A List of capabilities and medications.



Approved PBEC-CPD Activity without formal assessment.
Where a skill is involved, this may involve practical performance
of the skill.

Approved PBEC-CPD Activity with formal assessment.
Where a skill is involved, this may involve practical performance
of the skill.

OXYGENATION AND VENTILATION	CATEGORY OF REGISTRATION					
	BAA	AEA	ECT	ECA	ANT	ECP
Oxygen administration	✗	✗	✗	✗	✗	✗
Nebulisation of medications on scope of practice	✗	✗	✗	✗	✗	✗
Use of pulse oximetry	✗	✗	✗	✗	✗	✗
Needle thoracentesis (adult & paediatric)		✗	✗	✗	✗	✗
Needle thoracentesis (neonate)						✗
Bag-valve mask manual ventilation	✗	✗	✗	✗	✗	✗
Bag-valve tube manual ventilation	✗	✗	✗	✗	✗	✗
Interfacility mechanical ventilation (paediatric & adult - without cardiovascular support)					✗	✗
Mechanical ventilation (neonate)					✗	✗
Non-invasive ventilation with mechanical ventilator			✗	✗	✗	✗
Non-invasive ventilation - oxygen driven (without mechanical ventilator)			✗	✗	✗	✗
Mechanical infant resuscitator				✗	✗	✗
Use of capnography/capnometry - via endotracheal tube/extraglottic device				✗	✗	✗
Use of capnography/capnometry - via facemask/nasal cannula		✗	✗	✗	✗	✗
Humidification					✗	✗



Approved PBEC-CPD Activity without formal assessment.
Where a skill is involved, this may involve practical performance of the skill.

Approved PBEC-CPD Activity with formal assessment.
Where a skill is involved, this may involve practical performance of the skill.

CIRCULATORY MANAGEMENT

CATEGORY OF REGISTRATION

	BAA	AEA	ECT	ECA	ANT	ECP
Blood pressure measurement including the use of NIBP (automated)	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Peripheral intravenous cannulation as per relevant protocol - limbs & hands (all ages >1 year old)		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Peripheral intravenous cannulation as per relevant protocol - limbs & hands (all ages <1 year old)					ⓧ	ⓧ
Peripheral intravenous cannulation as per relevant protocol - (infant scalp)						ⓧ
External jugular vein cannulation					ⓧ	ⓧ
Intra-osseous insertion - all ages			ⓧ		ⓧ	ⓧ
Intra-osseous insertion - adult			ⓧ	ⓧ	ⓧ	ⓧ
Umbilical vein cannulation			ⓧ		ⓧ	ⓧ
Intravenous fluid therapy (for purposes other than drug administration - adult)		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Intravenous fluid therapy (for purposes other than drug administration - infant & paediatric)			ⓧ		ⓧ	ⓧ
Oral rehydration	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Oral rehydration via NGT					ⓧ	ⓧ
Intravenous/intraosseus drug administration as per scope of practice		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Subcutaneous drug administration as per scope of practice		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Intramuscular drug administration as per scope of practice		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ



Approved PBEC-CPD Activity without formal assessment.
Where a skill is involved, this may involve practical performance of the skill.

Approved PBEC-CPD Activity with formal assessment.
Where a skill is involved, this may involve practical performance of the skill.

CIRCULATORY MANAGEMENT

CATEGORY OF REGISTRATION

	BAA	AEA	ECT	ECA	ANT	ECP
Endotracheal drug administration					ⓧ	ⓧ
Use of intravenous infusion devices including pressure infuser, volumetric infusion pump & syringe driver			ⓧ		ⓧ	ⓧ
External haemorrhage control including use of tourniquet	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Topical haemostatic agents	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Use of pneumatic anti-shock garment		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Use of non-pneumatic anti-shock garment		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Automated external defibrillation	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Manual defibrillation (asynchronous)		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Precordial thump	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
Synchronised cardioversion					ⓧ	ⓧ
Vagal manoeuvres					ⓧ	ⓧ
Central line management of lines In-situ					ⓧ	ⓧ
Transcutaneous cardiac pacing					ⓧ	ⓧ
3-lead ECG monitoring & diagnosis as per scope of practice		ⓧ	ⓧ	ⓧ	ⓧ	ⓧ
12-lead ECG diagnosis						ⓧ
Fibrinolysis (with documented telemetry or equivalent)						ⓧ
Targeted temperature management (inter-facility transfer & where capabilities exist)						ⓧ



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of the skill.

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OBSTETRIC MANAGEMENT

	CATEGORY OF REGISTRATION					
	BAA	AEA	ECT	ECA	ANT	ECP
Normal vaginal delivery As per scope of practice	✖	✖	✖	✖	✖	✖
Prolapsed cord management As per scope of practice	✖	✖	✖	✖	✖	✖
Breech delivery management As per scope of practice	✖	✖	✖	✖	✖	✖
Mal-presentation management As per scope of practice	✖	✖	✖	✖	✖	✖
Pre-term labour management As per scope of practice	✖	✖	✖	✖	✖	✖
Obstructed labour management As per scope of practice	✖	✖	✖	✖	✖	✖
Post-partum haemorrhage management As per scope of practice	✖	✖	✖	✖	✖	✖

DIAGNOSTIC & CLINICAL AIDS

Use of ultrasound					✖	✖
Fundoscopy						✖
Use of an otoscope						✖
Use of Snellen Chart						✖
Arterial blood gas sampling & analysis						✖



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GENERAL

	CATEGORY OF REGISTRATION					
	BAA	AEA	ECT	ECA	ANT	ECP
Cardiac arrest management as per scope of practice (adult, child, infant, neonate)	✖	✖	✖	✖	✖	✖
Clinical assessment (as per level of care)	✖	✖	✖	✖	✖	✖
Vital sign assessment	✖	✖	✖	✖	✖	✖
Finger prick & blood glucose measurement (manual & electronic)	✖	✖	✖	✖	✖	✖
Peak flow measurement & interpretation		✖	✖	✖	✖	✖
Point of care blood sampling (capillary)					✖	✖
Cervical spine clearance		✖	✖	✖	✖	✖
Spinal movement restriction ¹	✖	✖	✖	✖	✖	✖
Application of limb splints	✖	✖	✖	✖	✖	✖
Application of pelvic binding devices	✖	✖	✖	✖	✖	✖
Application of vacuum mattress	✖	✖	✖	✖	✖	✖
Urinary catheterisation					✖	✖
Emergency wound care as per scope of practice	✖	✖	✖	✖	✖	✖
Suturing						✖
Withdrawal of resuscitation efforts		✖	✖	✖	✖	✖
Withholding resuscitation ²	✖ ²	✖	✖	✖	✖	✖
On-scene discharge ³						✖
Inter-facility transfer as per relevant scope of practice	✖	✖	✖	✖	✖	✖
Use of an incubator	✖	✖	✖	✖	✖	✖



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LIST OF MEDICATION
(ROUTE OF ADMINISTRATION)^{4,5}

CATEGORY OF REGISTRATION

	BAA	AEA	ECT	ECA	ANT	ECP
Acetyl salicylic acid	✕	✕	✕	✕	✕	✕
Activated charcoal	✕	✕	✕	✕	✕	✕
Adenosine					✕	✕
Adrenaline - use in anaphylaxis & cardiac arrest		✕	✕	✕	✕	✕
Adrenaline			✕		✕	✕
Amiodarone hydrochloride			✕		✕	✕
Atropine sulphate - use in toxidrome			✕	✕	✕	✕
Atropine sulphate			✕		✕	✕
Betamethasone						✕*
Calsium chloride/calsium gluconate					✕	✕
Clopidogrel					✕	✕
Hydrocortisone (IV)		✕	✕	✕	✕	✕
Methylprednisole (IV)		✕	✕	✕	✕	✕
Dexamethasone						✕*
Dextrose intravenous (adult)		✕	✕	✕	✕	✕
Dextrose intravenous (paediatric & neonate)		✕	✕		✕	✕
Dopamine						✕*
Diazepam			✕	✕	✕	✕
Dobutamine						✕*
Enoxaparin						✕
Etomidate						✕
Fentanyl (intravenous)					✕*	✕
Fentanyl (intranasal)					✕*	✕
Flumazenil (only in cases of iatrogenic benzodiazepine overdose)			✕	✕	✕	✕
Flumazenil						✕

*Mandatory emergency care practitioner and/or supervising medical officer consultation required



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LIST OF MEDICATION
(ROUTE OF ADMINISTRATION)^{4,5}

CATEGORY OF REGISTRATION

	BAA	AEA	ECT	ECA	ANT	ECP
Furosemide					✕	✕
Glugacon		✕*	✕	✕	✕	✕
Glyceryl trinitrate			✕		✕	✕
Heparin sodium						✕
Hydralazine						✕*
Ipratropium bromide	✕	✕	✕	✕	✕	✕
Ketamine - intravenous					✕	✕
Ketamine - intramuscular					✕	✕
Ketamine - intranasal					✕	✕
Labetalol						✕
Lignocaine hydrochloride (10 flush - local anaesthetic)			✕	✕	✕	✕
Lignocaine hydrochloride (systemic - arrhythmia management)						
Lorazepam			✕	✕	✕	✕
Magnesium sulphate (intramuscular)		✕*	✕	✕	✕	✕
Magnesium sulphate (intravenous)			✕		✕	✕
Medical oxygen	✕	✕	✕	✕	✕	✕
Metaclopramide monohydrochloride			✕		✕	✕
Midazolam			✕	✕	✕	✕
Morphine sulphate			✕*		✕	✕
Naloxone hydrochloride		✕*	✕	✕	✕	✕
Neostigmine						✕
Nifedipine (oral/IV)						✕*
Nitrates (intravenous)						✕*
Nitrous oxide	✕	✕	✕	✕	✕	✕

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LIST OF MEDICATION (ROUTE OF ADMINISTRATION) ^{4,5}	CATEGORY OF REGISTRATION					
	BAA	AEA	ECT	ECA	ANT	ECP
Odansetron						✗
Oral glucose powder/gel	✗	✗	✗	✗	✗	✗
Oxytocin			✗*		✗*	✗
Paracetamol (oral)					✗	✗
Paracetamol (intravenous)					✗*	✗
P2Y12 inhibitors						✗*
Prednisolone (oral)			✗		✗	✗
Promethazine			✗		✗	✗
Procainamide						✗
Rocuronium						✗
Sodium bicarbonate 8.5%					✗	✗
Sotalol						✗*
Sugammadex						✗
Streptokinase						✗
Suxamethonium chloride						✗
Tenecteplase						✗
Thiamine		✗	✗	✗	✗	✗
Tranexamic acid					✗	✗
Vecuronium						✗
β ² stimulants (inhaled)	✗	✗	✗	✗	✗	✗
β ² stimulants (systemic)			✗		✗	✗
Non-steroidal anti-inflammatories (non IV)					✗	✗
GP IIb/IIIa inhibitors						✗*
Direct thrombin inhibitors						✗*
Pentoxifyllane	✗	✗	✗	✗	✗	✗

**Mandatory emergency care practitioner and/or supervising medical officer consultation required*

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LIST OF MEDICATION (ROUTE OF ADMINISTRATION) ^{4,5}	CATEGORY OF REGISTRATION					
	BAA	AEA	ECT	ECA	ANT	ECP
Cyanide antidotes (- within occupational health & safety system)					⊗	⊗
Anti-emetic (- within remote site medicine scenario)						⊗
Anti-spesmodics (- within remote site medicine scenario)						⊗
Anti-diarrhoeals (- within remote site medicine scenario)						⊗

IMPORTANT ADDITIONAL NOTES (also see superscripts)

1. Includes the use of all evidence-based spinal motion restriction devices.
2. In the context of decapitation, mortal disfigurement, post-mortem lividity and putrefaction.
3. This implies that a formal clinical assessment and patient information session including subsequent referral/re-entry into the health system has been discussed with the patient. This process does not refer to a "refusal of hospital transport (RHT)" session
4. **IMPORTANT:** Use of additional medications not currently on the relevant scopes of practice is pending approval on the South African Health Products Regulatory Authority. The Professional Board will communicate to providers once this has occurred. Based on the approval, this list of medications may be subject to change.
5. CPD activities in relation to these medications may commence whilst awaiting regulatory approval.

Where additional skills/medications not previously on the scope of practice, have formed part of a Higher Education Institution PBEC-approved curriculum (including a formal assessment of such skills/medications) a PBEC-approved CPD activity is not mandatory. This is still, however, recommended.

All interventions and medications are to be formed and administered within the Clinical Practice Guidelines and a locally relevant standard of care. Clinical governance structures shall support these guidelines.

Where the list of capabilities indicate "...within scope of practice", this implies a relation to the medications available to the category of registration and related PBEC-approved education/training.

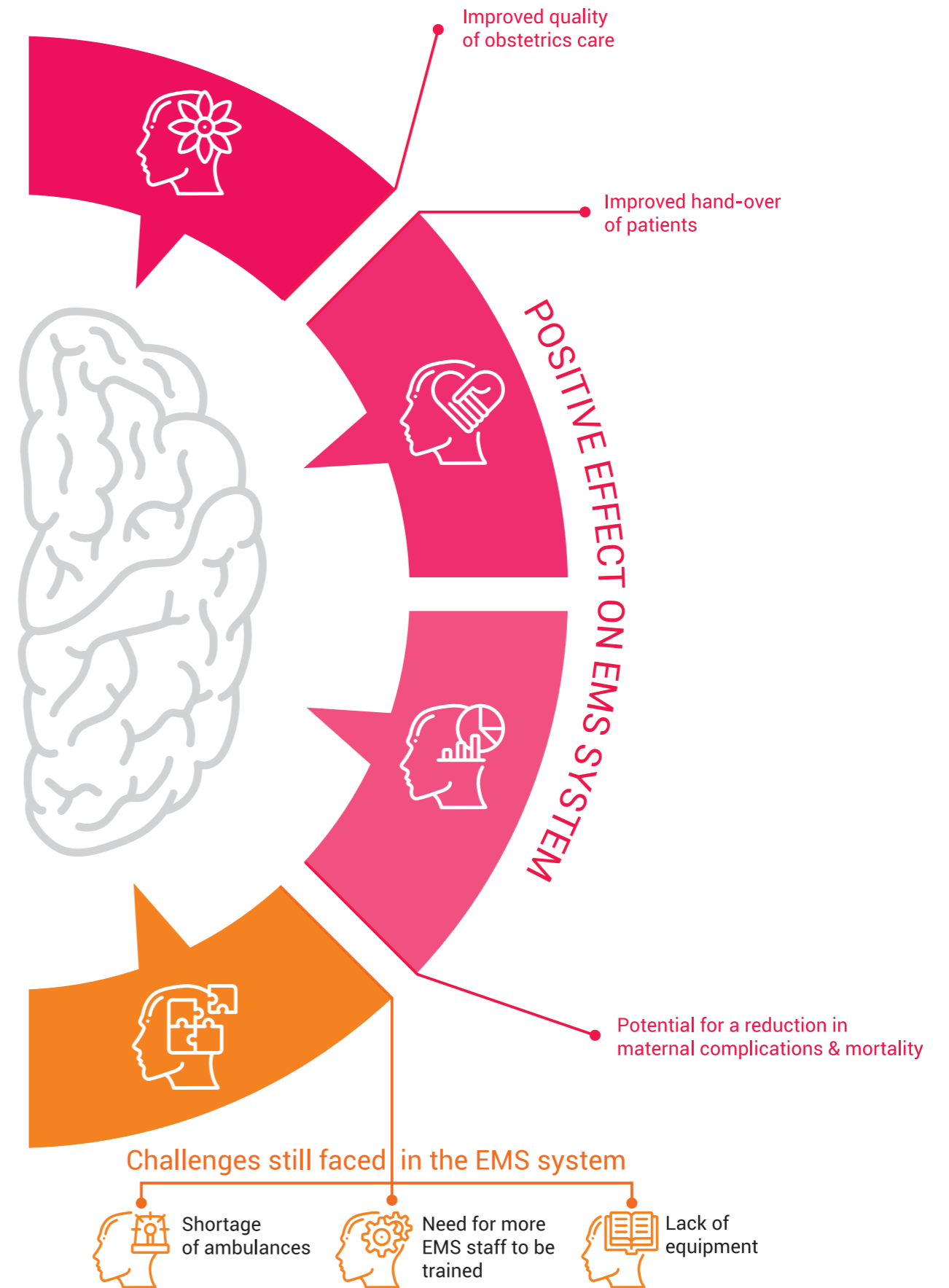
In relation to PBEC - approved CPD activities - where skills are concerned, the content of the activity must include indications, contraindications, risks, benefits and a description (either diagrammatic and/or demonstration) of the skill.

In relation to PBEC - CPD activities - where medications are concerned, the content of the activity must include the class of drug, schedule of drug, packaging of drug, storage of drug, mechanism of action, indications, contraindications, side-effects, technique/route of administration and recommended dosing range.

ANNEXURE 3: THEMATIC DIAGRAM



Figure 22. Qualitative Data Analysis Thematic Diagram



MSD for Mothers EVALUATION REPORT 2019

