EMERGENCY MEDICAL CARE PRACTITIONERS IN THE NORTH WEST PROVINCE: ASSESSMENT OF THEIR UNDERSTANDING OF THE EMERGENCY SERVICES DELIVERY ENVIRONMENT

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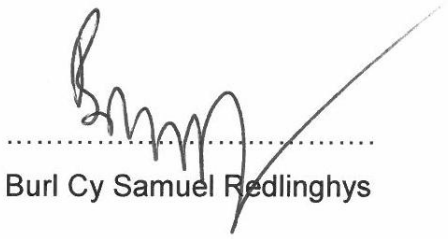
DECLARATION WITH REGARD TO INDEPENDENT WORK

I, BURL CY SAMUEL REDLINGHYS, identity number 680607 5145 080 and student number 212086197, do hereby declare that this research project submitted to the Central University of Technology, Free State for the Magister Technologiae: Public Management degree, is my own independent work; and complies with the Code of Academic Integrity, as well as other relevant policies, procedures, rules and regulations of the Central University of Technology, Free State; and has not been submitted before to any institution by myself or any other person in fulfilment (or partial fulfilment) of the requirements for the attainment of any qualification.



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SUMMARY

The purpose of this study is to assess the Emergency Medical Care Practitioners' understanding of the Emergency Medical Services delivery environment of the North West Province in which they function. The knowledge gained in this regard will then enable the North West Provincial Government to amend its policies and procedures to create a better Emergency Medical Services delivery environment in order to save lives during the so-called "golden hour".

The study was conducted amongst the different sectors of the Emergency Medical Services in the North West Province. Data was collected by means of a survey of Emergency Medical Care Practitioners with the aid of questionnaires. The data was analysed using interpretive methods of analysis in order to achieve the research objectives.

Most of the responses by the Emergency Medical Care Practitioners indicate inward focussing; there is no consideration of the needs of the community. The lack of computerization in the system hampers planning processes within the service and has a negative impact on the delivery of Emergency Medical Services. The results have also shown that there is an urgent need to improve the skills levels of Emergency Medical Care Practitioners, thereby improving patient care.

Emergency Medical Care Practitioners do not have a good understanding of the service delivery environment in which they operate. A multi-faceted approach is required to improve their understanding and thereby improve service delivery in the field of Emergency Medical Services in the North West Province.

ACKNOWLEDGEMENTS

The success of this dissertation would not be possible without the help of Almighty God, my eternal Father, and the following persons to whom I am indebted in gratitude.

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GLOSSARY OF TERMS

Advanced Life Support

A health care professional that has completed either a Critical Care Assistant Course or National Diploma/Degree in Emergency Medical Care and whose name appears on the Advanced Life Support register of the Health Professions Council of South Africa.

Ambulance

An ambulance is a vehicle for the transportation of sick or injured people to, from or between places of treatment for an illness or an injury. Normally ambulances are fitted with warning devices to alert other road users. An ambulance is utilized in the pre-hospital environment.

Annual Performance Plan

A plan developed annually by every government institution, which provides an outline on how that institution is expected to perform in the achievement of their objectives in the next financial year.

Ambulance Emergency Assistant

A health care professional trained at an intermediate life support level. This qualification is a four-month certificate course.

Basic Ambulance Assistant

A health care professional trained at a basic life support level. This qualification is a one-month certificate course.

Basic Life Support

A health care professional that has completed a Basic Ambulance Certificate and whose name appears on the Basic Life Support register of the Health Professions Council of South Africa.

Bojanala District

A district that is located in the North West Province comprising five sub-districts namely: Kgetleng Rivier, Rustenburg, Moses Kotane, Moretele and Madibeng with Rustenburg as the district seat. The district has a surface area of 18,333 square kilometres or 17.48% of the province's land area. There are 501,696 households in the district. The population of the district is 1,507,505 and the population density is 82.2 per square kilometre. The majority of the population speak Setswana at 54.3%, followed by Afrikaans at 7.9%. The population of the district is predominantly African at 91.4%, followed by Whites at 7%.

Critical Care Assistant

A health care professional trained at an advanced life support level. This qualification is a nine-month certificate course.

Definitive Medical Care

Completed therapy; end point at which all treatment required at the time has occurred.

Doctor Kenneth Kaunda District

A district in the North West Province comprising four sub-districts namely: Ventersdorp, Matlosana, Tlokwe and Maquassi Hills with Klerksdorp as the district seat.

The district has a surface area of 14,642 square kilometres which is 13.96% of the province's land area. There are 208,047 households in the district. The population of the district is 695,933 and the population density is 47.5 per square kilometre. The majority of the population speak Setswana at 44.1%, followed by Afrikaans at 18.1%. The district is predominantly African at 80.3%, followed by Whites at 14.5%.

Doctor Ruth Segomotsi Mompati District

It is a district in the North West Province comprising five sub-districts namely: Naledi, Mamusa, Taung, Kagisano/ Molopo and Lekwa Temane with Vryburg as the district seat. The district has a surface area of 43,700 square kilometres or 41.67% of the province's land area. There are 125,270 households in the district. The population of the district is 463,815 and the population density is 10.6 per square kilometre. The majority of the population speak Setswana at 83%, followed by Afrikaans at 7.6%. The district is predominantly African at 91.4%, followed by Whites at 3.9%.

Emergency Care Practitioner

A health care professional trained at an advanced life support level. This qualification is a tertiary qualification equivalent to a four-year degree.

Emergency Care Technician

A health care professional trained at an advanced life support level. This qualification is a tertiary qualification equivalent to a year's Further Education and Training qualification.

Emergency Medical Care Practitioner

An Emergency Medical Care Practitioner is any person who works operationally in an Emergency Medical Services environment, regardless of the level of Emergency Medical Care training. This may be at a basic, intermediate or advanced level.

Emergency Medical Services

Emergency Medical Services are a type of emergency service dedicated to providing pre-hospital acute medical care, transportation to definitive care, and other medical transport to patients with illnesses and injuries which prevent the patient from transporting themselves. Thus Emergency Medical Services are a service that is responsible for the treatment and transportation of critically ill patients in a pre-hospital environment. This may consist of primary responses, such as accident scenes, and inter-facility transfers. Primarily, an ambulance is utilized to respond to a patient, a response vehicle is used in the case of a major incident or the unavailability of an ambulance.

Intermediate Life Support

A health care professional that has completed an Ambulance Emergency Assistant course and whose name appears on the Intermediate Life Support register of the Health Professions Council of South Africa.

Golden hour

It refers to the time period from when a patient sustains an injury to the time the patient receives medical treatment that will prevent death.

Health Care Professional

A medically trained person who is required to be registered with the Health Professions Council of South Africa or the South African Nursing Council, in order to practise. This is irrespective of their level of training or speciality.

Mission time

Mission time is calculated from the time a member of the public or other professional, such as a medical doctor or nurse, requests the assistance of an ambulance until the time that the same ambulance has completed the service to the patient and is available for the next call. Cleaning and refuelling an ambulance form part of the mission time.

Morbidity

Morbidity refers to the incidence of disease or rate of illness within a population.

Mortality

Mortality is the term used for the number of people who died within a population.

National norm

National norm refers to the norms that have been set by the National Department of Health in consultation with the Provincial Department of Health. These norms deal with areas of clinical governance and service delivery. The said norms allow the National Department to measure the Provincial Departments against each other.

Ngaka Modiri Molema District

A district in the North West Province comprising five sub-districts namely: Mahikeng, Ditsobotla, Ramotshere Moilwa, Tswaing and Ratlou with Mahikeng as the district seat.

The district has a surface area of 28,206 square kilometres or 26.89% of the province's land area. There are 227,001 households in the district. The population of the district is 842,699 and the population density is 29.9 per square kilometre. The majority of the population speak Setswana at 80.9%, followed by Afrikaans at 5%. The district is predominantly African at 93.3%, followed by Whites at 3.7%.

North West Province

The North West Province is South Africa's fourth smallest province, taking up 8.7% of South Africa's land area, with a surface area of 104,881 square kilometres. As the name of the province indicates, it is situated in the north-west region of South Africa. Its neighbouring provinces are Limpopo, Gauteng, the Free State and the Northern Cape. It shares its border with Botswana. The population of the province consists of 3,509,953 people and the population density is 33 per square kilometre. There are 1,062,014 households in the province. The majority of the population speak Setswana at 63, 4%, followed by Afrikaans at 9%. The district is predominantly African at 89.8%, followed by Whites at 7.3%.

Response time

Response time is calculated from the time a member of the public or other professional, such as a medical doctor or nurse, requests the assistance of an ambulance until the time that the ambulance arrives at the patient or on the scene. This calculation is done by the Emergency

Communication Centre as well as each individual station. The response times have been fixed at 15 minutes in an urban area and 40 minutes in a rural area.

Response vehicle

A response vehicle is an emergency vehicle that has been fitted with warning devices to alert other road users. It is not utilized to transport patients but serves to rapidly respond to stabilize a patient until an ambulance arrives.

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1.1 INTRODUCTION

This research looks into the perceptions of Emergency Medical Care Practitioners in the North West Province in order to assess their understanding of the Emergency Medical Services delivery environment they work in.

1.2 PROBLEM STATEMENT

The poor standard of patient care in the North West Province Emergency Medical Services seems to be due to numerous factors.

Firstly, the inadequate response times in relation to the national norm of 15 minutes in an urban area and 40 minutes in a rural area (North West Province 2012/13:81). In essence, this means that the longer it takes for the emergency service vehicle to get to the patient, the greater the delay in the commencement of the patient's treatment. Thus it would take longer for the patient to get to a definitive medical care facility. This has a direct impact on the morbidity and mortality rate of patients. Consequently this could bring about a dramatic increase in the cost of patient treatment. Treating the fracture of an arm or leg early could prevent complications and possibly even an amputation later on.

Secondly, the apparently inadequate skills level of Emergency Medical Care Practitioners who are employed within the Emergency Medical Services of the North West

Province. This means that even if an ambulance does get to a patient in time, the level of treatment given to the patient may not be adequate. The quality of care that is given to the patient by the Emergency Medical Care Practitioner will thus be measured. It can be assumed that the combination of higher qualifications and levels of experience of the Emergency Medical Care Practitioner would result in an improved quality of care for the patient. The assumption is based on the fact that if an Emergency Medical Care Practitioner has a higher qualification, then he has been trained to provide the patient with a better skill set. In addition, the longer the Emergency Medical Care practitioner has been providing treatment, the more developed his skills should have become. This will have to be measured by means of patient satisfaction surveys and an improved Clinical Governance programme. In essence, this should improve the continuum of care, from the pre-hospital environment to the hospital environment, and thus also reduce mortality and morbidity.

Thirdly, the patient's location in relation to the resources in terms of Emergency Medical Care is also of importance. A patient in an urban setting is not only closer to Emergency Medical Services resources, but also to more advanced hospital care. The national norms that determine response times also discriminate against rural communities as they are measured against 40 minutes, whilst in an urban community the patient has only to wait for 15 minutes. The sparser the population, the more expensive it gets to place resources closer to them. Thus the issue of access and the placement of resources becomes a juggling act.

These matters, however, may not be the only problems, and further research will have to be done to address this situation.

The responses of the Emergency Medical Care Practitioners in the North West Province have been assessed by analysing their answers provided in the questionnaires to ascertain their understanding of the present situation, and their perceptions with regard to training, skills development, response times and the improvement of service delivery.

The Emergency Medical Services in the North West are a relatively new service which has only been providing services since 2001. The objective of this research project is to assist the province in gaining a better understanding of the service delivery environment and the competencies and training needs of Emergency Medical Care Practitioners in that environment. It will also give management better insight into making improvements to the service delivery environment in respect of a decision that has an impact on staff and patients. This process will assist in advancing the service for all clients utilizing the Emergency Medical Services. An added benefit is that it would also create a more conducive working environment for the Emergency Medical Practitioners employed in the Emergency Medical Services.

1.3 RATIONALE

The standard of patient care in the North West Province Emergency Medical Services is not at an optimal level. Long waiting times due to poor response times as well as unsuitably skilled staff may be the greatest barriers to quality care. It is surmised that by addressing these

problems, the quality and continuum of care will be improved. However, if Emergency Medical Care Practitioners in the province are not aware of the ramifications of this state of affairs, any solutions or service delivery improvements are bound to fail. The poor induction programme implemented during the appointment of new staff at their point of employment and the high turnover of staff within Emergency Medical Services further exacerbate this problem. The understanding of these important issues is thus imperative.

1.3.1 Response times

The norm for response times laid down by the National Department of Health is 15 minutes in an urban area and 40 minutes in a rural area. The norm set for response times by the National Department of Health for all provinces is 75% of all calls received. This means that in 75% of the calls received and responded to the response times should be met. This is confirmed by MacFarlane, Van Loggerenberg and Kloeck (2005:145). In other words, Emergency Medical Services should endeavour to reach the patient in 75% of the cases within the set norm of 15 minutes in an urban environment or 40 minutes in a rural environment. It should, however, be noted that the national norm allows for a 25% deviation and thus all the above percentages were calculated against the norm of 75% and not the ideal of 100%. This means that a certain percentage of the population will always fall outside this target when measuring response times.

According to the audited figures of the North West Department of Health for the 2007/08 financial year, the response times for calls responded to within 15 minutes in

urban areas was 52.3%, and for calls responded to within 40 minutes in rural areas was 50% (North West Province 2010/11:60). The audited figures were obtained from the information collected by each individual ambulance and collated at station level, followed by district level and then finally provincial level. This information is collected by the ambulance driver on his trip sheet and is duplicated in the communication centre on the call sheet. The duplication in the communication centre is done via two-way radio communications. The accuracy of this figure can be contested as the data is collected and collated manually. Manual data can be manipulated and thus the accuracy can be questioned. It should also be noted that the response times do not differentiate between an ambulance and a response vehicle when calculating the response time. Thus the figure only indicates that an Emergency Medical Services vehicle arrived at the patient and not how long it took to transport that patient to the nearest health facility. The audited figure for the 2010/11 financial year for calls responded to within 15 minutes in urban areas was 73%, and for calls responded to within 40 minutes in rural areas was also 73% (North West Province 2012/13:81).Though this is a significant improvement on the 2007/08 figure, it is still below the national norm. Thus, the North West Province is not meeting its national predetermined targets. The difference may just be 2%, but the additional resources required to reach that target are huge.

The North West Province is divided into four Districts, namely Doctor Kenneth Kaunda (DKK), Ngaka Modiri Molema (NMM), Doctor Ruth Segomotsi Mompati (DRSM) and Bojanala. The response times in the different Districts vary greatly in relation to the national norm.

Variations in the urban response times as per the national norm, which is 75% of the call within 15 minutes, based on the 2007/08 figures were:

- Bojanala was 17.6% below the norm;
- Doctor Kenneth Kaunda was 25% below the norm;
- Ngaka Modiri Molema was 13% below the norm; and
- Doctor Ruth Segomotsi Mompati was 49% below the norm.

Variations in the urban response times as per the national norm, which is 75% of the call within 15 minutes, based on the 2009/10 figures were:

- Bojanala was 4% above the norm,
- Doctor Kenneth Kaunda was 6% below the norm;
- Ngaka Modiri Molema was 19% below the norm; and
- Doctor Ruth Segomotsi Mompati was 5% above the norm.

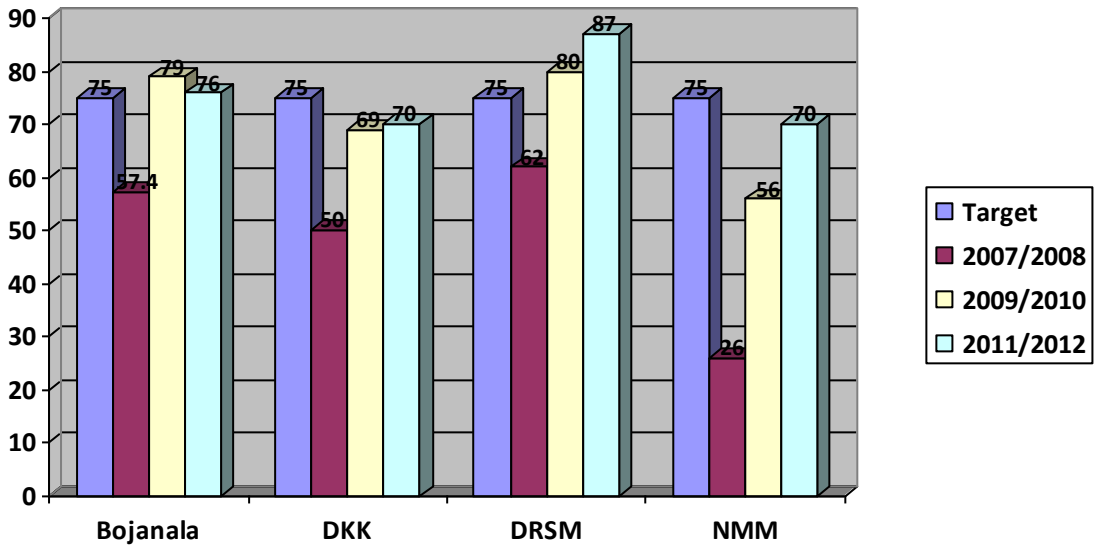
Variations in the urban response times as per the national norm, which is 75% of the call within 15 minutes, based on the 2010/11 figures were:

- Bojanala was 1% above the norm;
- Doctor Kenneth Kaunda was 5% below the norm;
- Ngaka Modiri Molema was 5% below the norm; and
- Doctor Ruth Segomotsi Mompati was 12% above the norm.

Chart 1 below shows that even though there have been marked improvements in every district, whose reasons are largely unknown, there are still huge variances between districts and even within the same district from one year to the next. This may be attributed to the paper-based manual system that is utilized to collect and collate data. It should

be noted that if the figures are not reliable then an analysis of the figures may lead to the wrong decisions. This would result in no actual improvement as the wrong areas are being addressed.

Chart 1: Urban response times



Variations in the rural response times as per the national norm, which is 75% of the call within 40 minutes, based on the 2007/08 figures were:

- Bojanala was 6% above the norm;
- Doctor Kenneth Kaunda was 25% below the norm;
- Ngaka Modiri Molema was 1% above the norm; and
- Doctor Ruth Segomotsi Mompati was 38% below the norm.

Variations in the rural response times as per the national norm, which is 75% of the call within 40 minutes, based on the 2009/10 figures were:

- Bojanala was 3% above the norm;

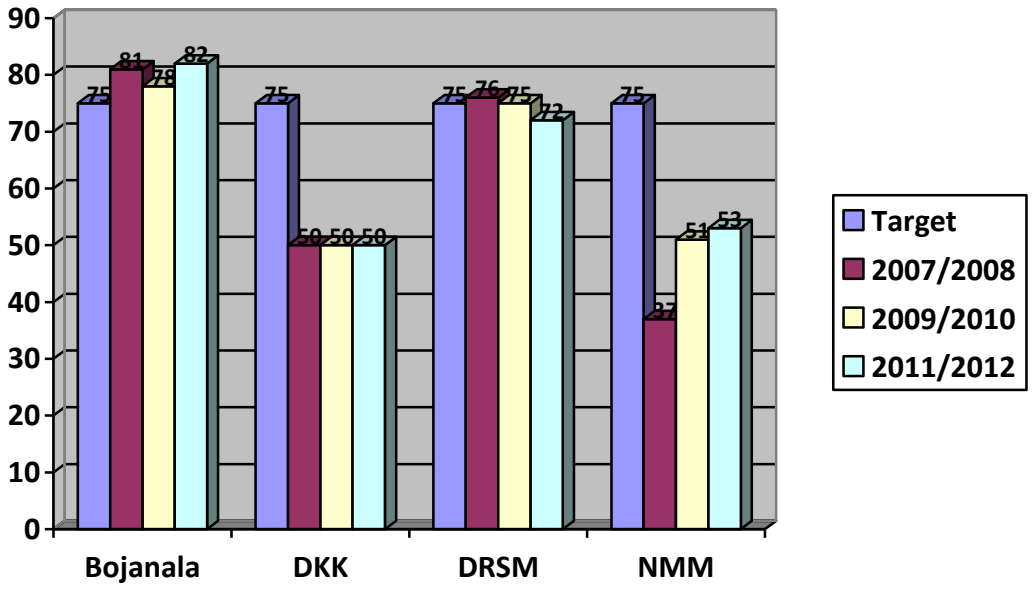
- Doctor Kenneth Kaunda was 25% below the norm;
- Ngaka Modiri Molema was 24% below the norm; and
- Doctor Ruth Segomotsi Mompati met the norm.

Variations in the rural response times as per the national norm, which is 75% of the call within 40 minutes, based on the 2011/12 figures were:

- Bojanala was 7% above the norm;
- Doctor Kenneth Kaunda was 19% below the norm;
- Ngaka Modiri Molema was 22% below the norm; and
- Doctor Ruth Segomotsi Mompati was 3% below the norm.

Chart 2, which represents rural response times, thus shows a picture similar to the urban response times indicated in **Chart 1**.

Chart 2: Rural response times



1.3.2 Training levels

The majority of the staff in the North West Emergency Medical Services is at a basic level of training. Ideally each ambulance should have a staff complement of two people. This is important so that whilst a patient is being transported to a health facility, the patient can still receive care from the second crew member. At least one of the two should be trained to an intermediate level.

Ideally, Emergency Medical Services should have a 50% Basic Life Support, 50% Intermediate Life Support and an additional five% Advanced Life Support split in terms of trained practitioners. Thus, if there are ten Basic Life Support staff, there should be ten Intermediate Life Support staff. In addition to that, there should be one Advanced Life Support staff member. This, however, is far removed from what is actually taking place at the coalface both provincially and nationally.

Emergency Medical Care Practitioners with higher skills levels would be able to provide the necessary treatment quicker to the patient, thus improving patient care. The sooner the ambulance arrives at the patient and emergency care is administered, the better the prognosis for the patient.

The following information is based on the figures of the North West Department of Health (2010:60) for the 2007/08 financial year.

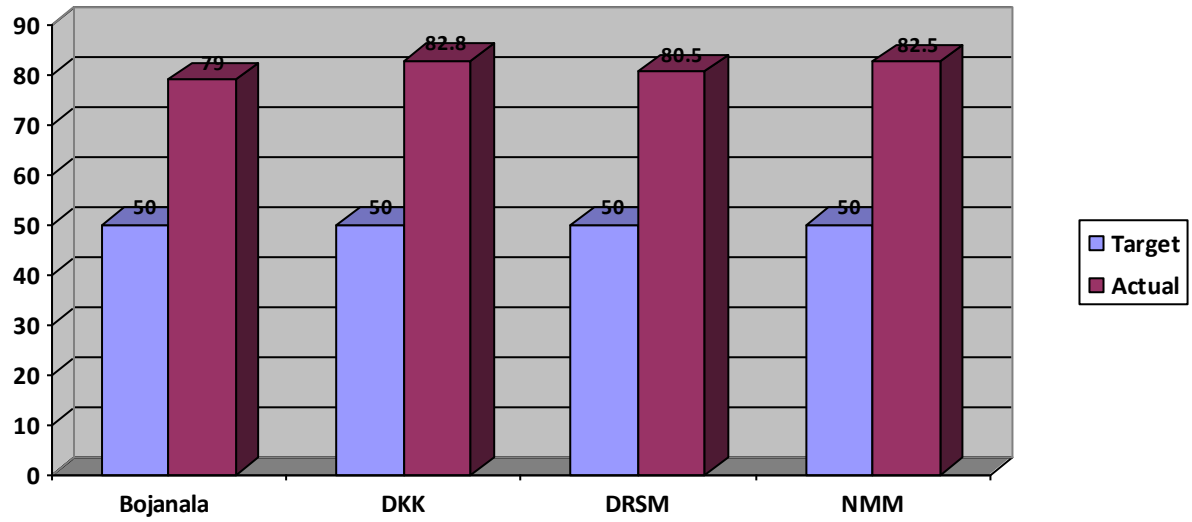
The level of Basic Life Support staff should be at a maximum of 50% as per the national norm. This should be a maximum of one member on every ambulance. The variation of Basic

Life Support staff as per the national norm of 50%, as indicated in **Chart 3** below, is:

- Bojanala has a 29% oversupply of staff with the basic qualification;
- Doctor Kenneth Kaunda has a 32.8% oversupply of staff with the basic qualification;
- Ngaka Modiri Molema has a 30.5% oversupply of staff with the basic qualification; and
- Doctor Ruth Segomotsi Mompati has a 32.5% oversupply of staff with the basic qualification.

An oversupply means that there are more Basic Life Support trained practitioners than are actually needed to provide the service. Also, there are insufficient qualified practitioners at the higher levels in the country as a whole. Thus the Emergency Medical Services had no option but to appoint staff with lower qualification levels to ensure that a service is rendered to the community.

Chart 3: Basic Life Support levels



The level of Intermediate Life Support staff should be at 50% as per the national norm. This should be a minimum of one member on every ambulance. The variation of Intermediate Life Support staff as per the national norm of 50%, as indicated in **Chart 4** below, is:

- Bojanala has a 30% undersupply of staff with the intermediate qualification;
- Doctor Kenneth Kaunda has a 34% undersupply of staff with the intermediate qualification;
- Ngaka Modiri Molema has a 31% undersupply of staff with the intermediate qualification; and
- Doctor Ruth Segomotsi Mompati has a 33% undersupply of staff with the intermediate qualification.

The undersupply is due to the fact that there are insufficient qualified practitioners at this level in the country as a whole.

Chart 4: Intermediate Life Support levels

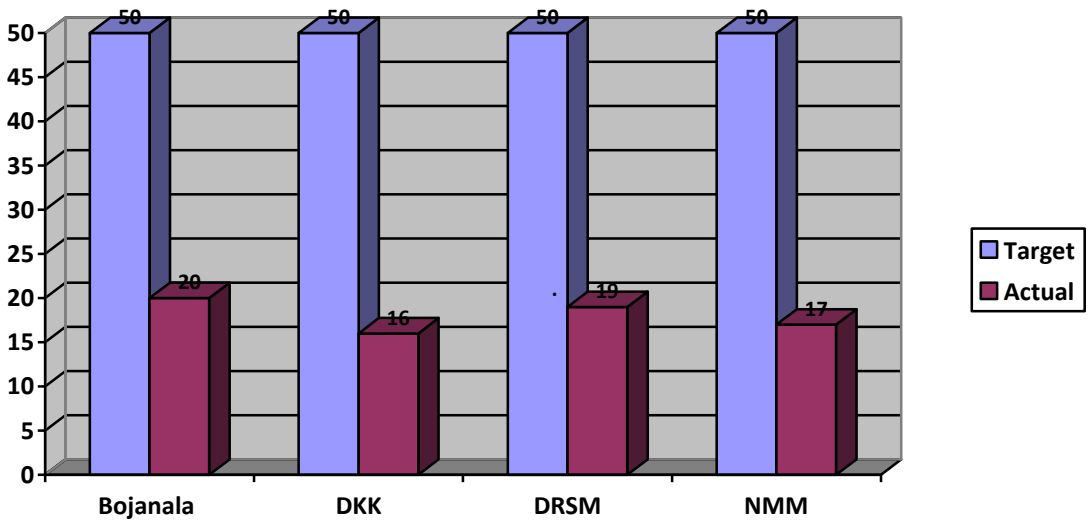


Table 1 shows the registration of different categories of Emergency Medical Care Practitioners with the Health

Professionals Council of South Africa (HPCSA) as per the annual reports.

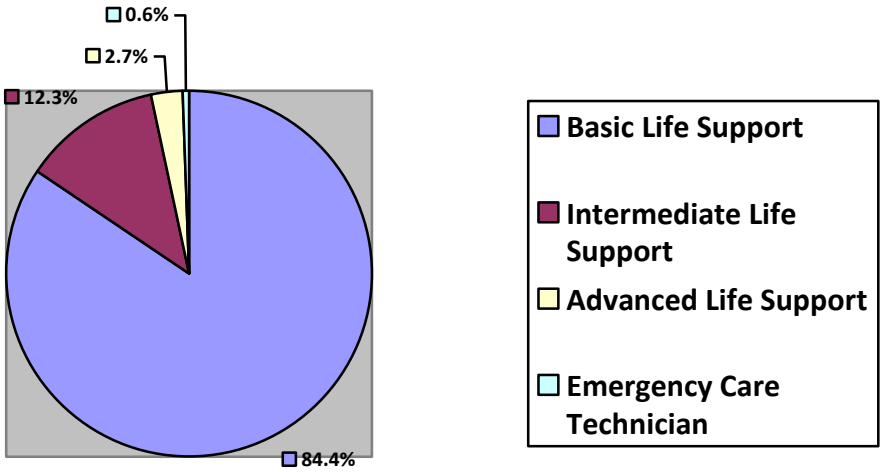
Table 1: Emergency Medical Care Practitioner registrations

Category	2010/11	2011/12	2012/13
Basic Life Support Practitioners	88,031	49,777	51,818
Intermediate Life Support Practitioners	10,606	6,934	7,539
Advanced Life Support Practitioners	1,712	1,523	1,657
Emergency Care Technicians	111	303	397
Source	HPCSA (2010:11)	HPCSA (2011:14)	HPCSA (2012:11)

The decrease in registrations from the 2010/11 financial year to the 2011/12 financial year is due to an audit done by the HPCSA. This resulted in numerous Emergency Medical Care Practitioners being deregistered from the Council. The reason was mainly due to the non-payment of registration fees.

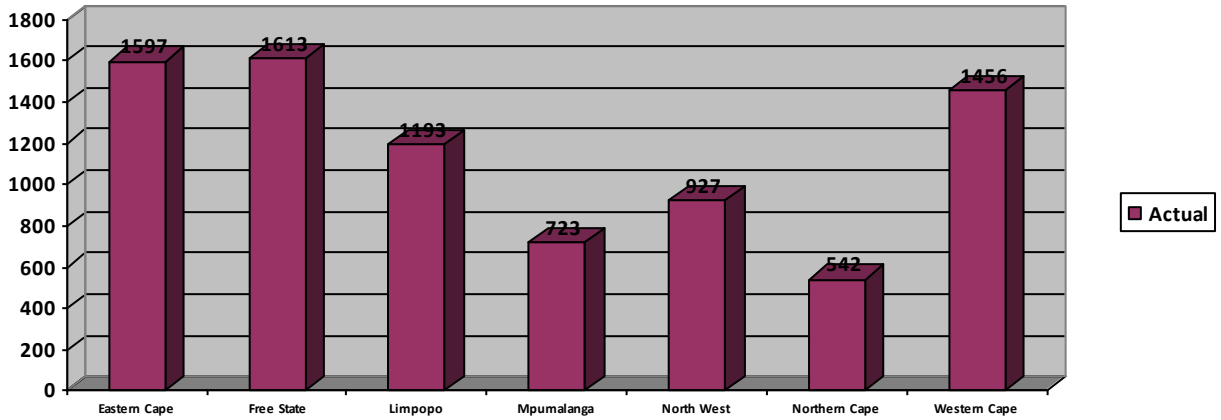
The registrations for the 2012/13 financial year are shown in **Chart 5** below. This shows an oversupply of 34% for Basic Life Support (BLS) Practitioners and an undersupply of 38% of Intermediate Life Support (ILS) Practitioners. As can be seen, the numbers of Advanced Life Support (ALS) Practitioners are negligible.

Chart 5: HPCSA registers



Of all Emergency Medical Care Practitioners only 11,000 are estimated to work within the public sector as per statistics obtained from the National Department of Health. There is therefore a huge oversupply of qualified Basic Life Support Practitioners within the country as indicated in **Chart 6** below. However, figures from Gauteng and KwaZulu-Natal are excluded.

Chart 6: Emergency Medical Services staff per province (December 2011)



The training of Emergency Medical Care Practitioners has been historically slow as the country as a whole has not been able to deliver the number of qualified staff required. The information from the HPCSA Annual Report for 2008/09 (HPCSA (2009:8) is indicated in **Table 2** below.

Table 2: Emergency Medical Care Practitioner registrations per year

Category		2004	2005	2006	2007	2008
Basic Life Support Practitioners	Numbers	22,826	24,952	29,604	34,628	38,700
	Year on year increase	-	2,126	4,652	5,024	4,072
	Percentage increase	-	9.3	18.6	16.9	11.8
Intermediate Life Support Practitioners	Numbers	4,772	4,943	5,314	5,553	5,844
	Year on year increase	-	171	371	239	291
	Percentage increase	-	3.6	7.5	4.5	5.2
Advanced Life Support Practitioners	Numbers	964	1,050	1,128	1,185	1,205
	Year on year increase	-	86	78	57	20
	Percentage increase	-	8.9	7.4	5	1.7

Chart 7 below shows the percentage increase per category from 2005 to 2008. The increase in training at the Basic Life Support level should be noted, as well as the sharp decline in the Advanced Life Support level.

Chart 7: Percentage increases per category

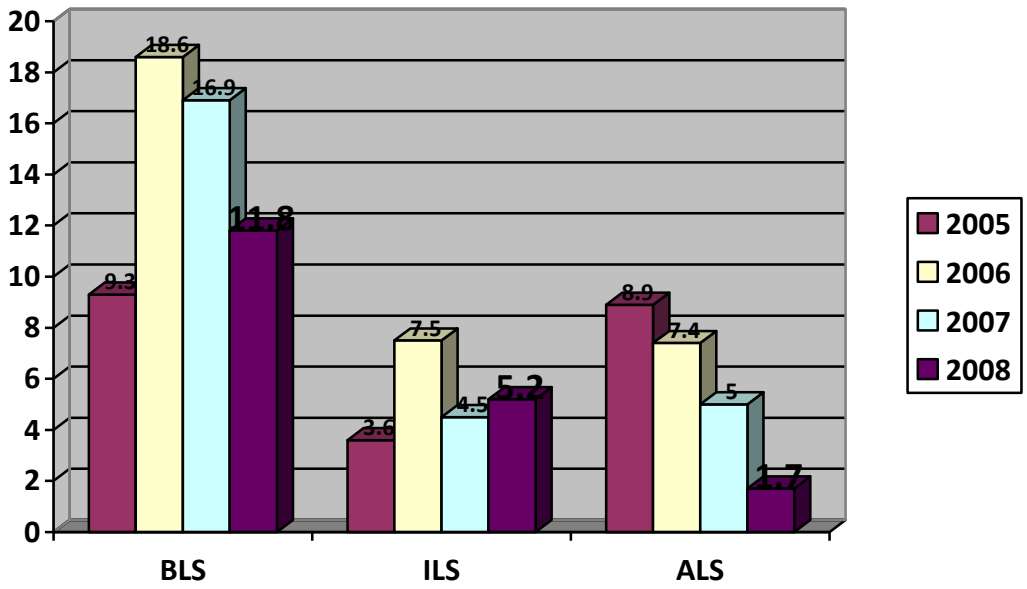
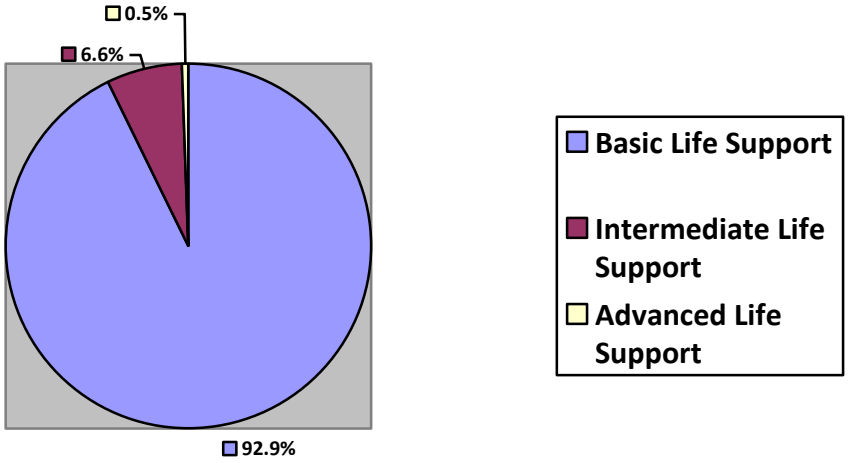


Chart 8 below shows the percentage increase per category from 2007 to 2008. It should be noted that Emergency Care Technicians are not included as their first year of registration with the HPCSA was 2009.

Chart 8: Increase in Emergency Medical Care Practitioners from 2007 to 2008



The above trend indicates why the qualification level of staff working on ambulances is not improving. Too many people are being trained at the basic level. In order to improve the situation and quality of patient care, more staff should be trained at the advanced level.

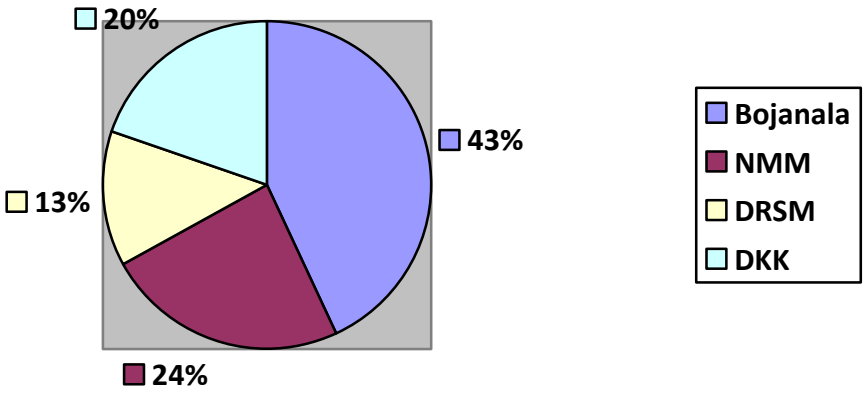
1.3.3 Area and population density

The North West Province is the fourth smallest province in South Africa, which covers 8.7% of the land area of South Africa, and had a population of 3,200,000 (North West Province, 2012/13:18) in 2012. This population increased to 3,509,953 in 2013.The area of the province is important in terms of distance and the time that it takes for an ambulance to travel to a patient. The population density also poses a challenge in terms of ambulance response times. Areas with sparse population normally do not have ambulance bases and therefore the travelling distance to that population is usually longer. Thus, the more remote the community, the more difficult it is to respond to that community within the existing norms.

The population per District, as indicated in **Chart 9** below, is:

- 1,507,505 in Bojanala;
- 842,699 in Ngaka Modiri Molema;
- 463,815 in Doctor Ruth Segomotsi Mompati; and
- 695,933 in Doctor Kenneth Kaunda.

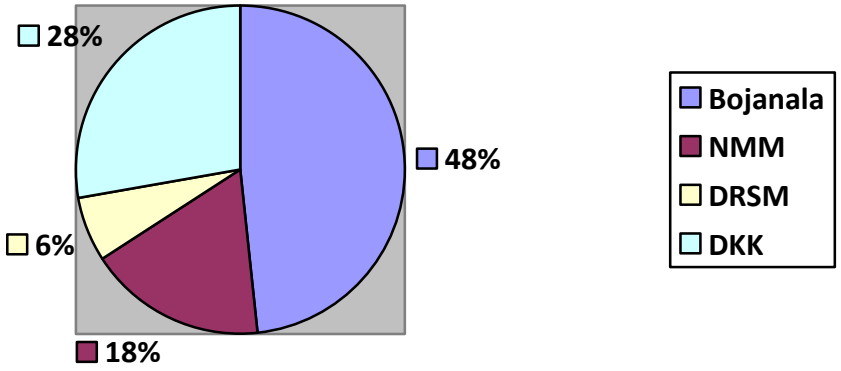
Chart 9: Population distribution



The population density per square kilometre per District, as indicated in **Chart 10** below, is:

- 82.2 in Bojanala;
- 29.9 in Ngaka Modiri Molema;
- 10.6 in Doctor Ruth Segomotsi Mompati; and
- 47.5 in Doctor Kenneth Kaunda.

Chart 10: Population density



The sparse distribution of the population in Dr Ruth Segomotsi Mompati makes it difficult to deliver Emergency Medical Services in that District. A large number of ambulances are required to meet the targets set. However, as those ambulances stand idle most of the time it is indicative of an ineffective use of resources.

1.3.4 Ambulance distribution

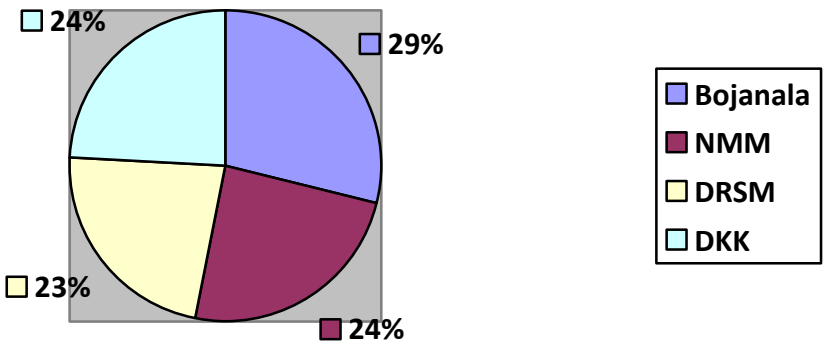
The North West Province, as mentioned earlier, is divided into four different Districts. The ambulances are allocated as per **Table 3**:

Table 3: Ambulance distribution per District

District	Station	Main Town	Number of ambulances
NMM	Ditsobotla	Lichtenburg	4
	Mahikeng	Mahikeng	4
	Tswaing	Delareyville	3
	Ratlou	Ratlou	2
	Ramotshere Moilwa	Zeerust	3
DRSM	Taung	Taung	4
	Naledi	Vryburg	3
	Kagisano-Molopo	Ganyesa	3
	Mamusa	Schweizer Reneke	2
	Lekwa Temane	Bloemhof	3
DKK	Ventersdorp	Ventersdorp	3
	Maquassi Hills	Wolmaransstad	2
	Matlosana	Klerksdorp	7
	Tlokwe	Potchefstroom	4
Bojanala	Rustenburg	Rustenburg	5
	Moses Kotane	Moses Kotane	3
	Kgetleng River	Swartruggens	3
	Madibeng	Brits	5
	Moretele	Moretele	3

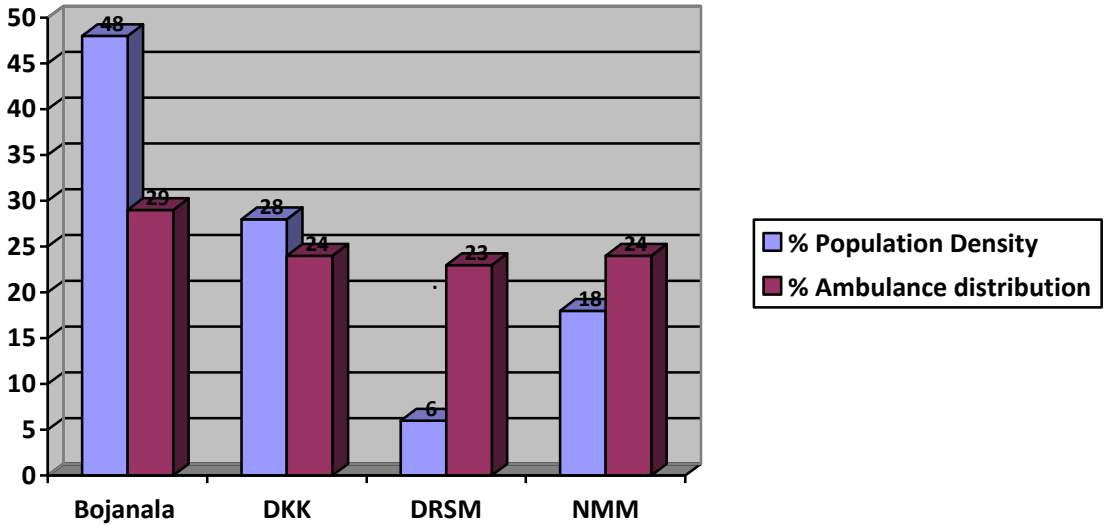
Thus the distribution of ambulances in the Province as per the following **Chart 11** is:

Chart 11: Ambulance distribution



Based on the information on the population density of **Chart 10**, **Chart 12** shows the relationship between population density and the distribution of ambulances. This shows that Bojanala is hugely under-resourced whilst Dr Ruth Segomotsi Mompati is vastly over-resourced. Ngaka Modiri Molema is slightly over-resourced whilst Dr Kenneth Kaunda is somewhat under-resourced. The analysis is in relation to the available resources and not according to the ideal resources required. However, if the response times are looked at it would not be wise to remove resources from Dr Ruth Segomotsi Mompati, as they would have to be slightly increased. Though Bojanala seems under-resourced, the response times are not particularly bad. This is due to the density of the population and the fact that even though there are fewer ambulances they are being optimally utilized.

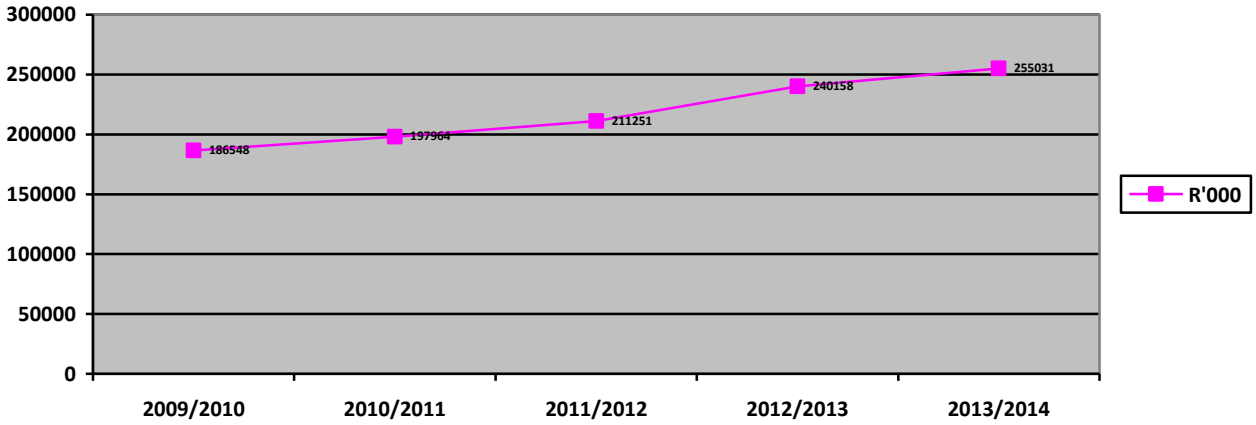
Chart 12: Population density vs. ambulance distribution



1.3.5 Budget allocation

The budget for Emergency Medical Services has had an incremental increase year on year as shown in **Chart 13**. The allocation for Emergency Medical Services in the 2013/14 financial year is 3.38% of the total Provincial Health budget of R7,544,535,000(North West Provincial Treasury (2012:73).

Chart 13: Emergency Medical Services yearly budget

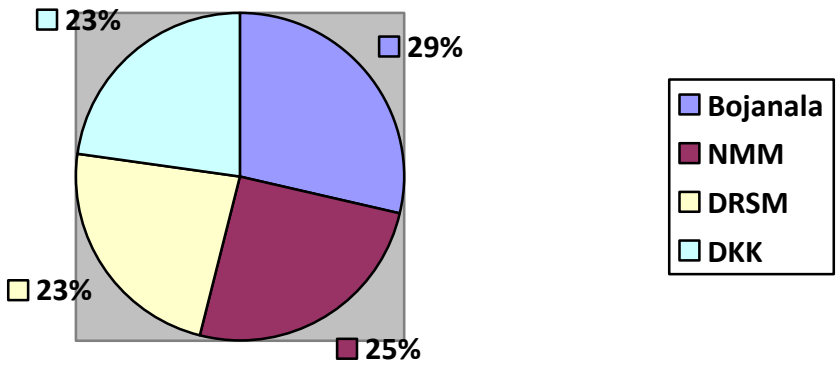


The allocated budget per District for Emergency Medical Services in the North West Province (excluding the Head Office) is indicated in **Table 4,** with a graphical representation shown in **Chart 14.**

Table 4: Budget allocation per district

District	Budget
Bojanala	R64,492,478
NMM	R57,037,997
DRSM	R52,197,073
DKK	R51,553,011
Head Office	R28,568,441
Total	R255,031,000

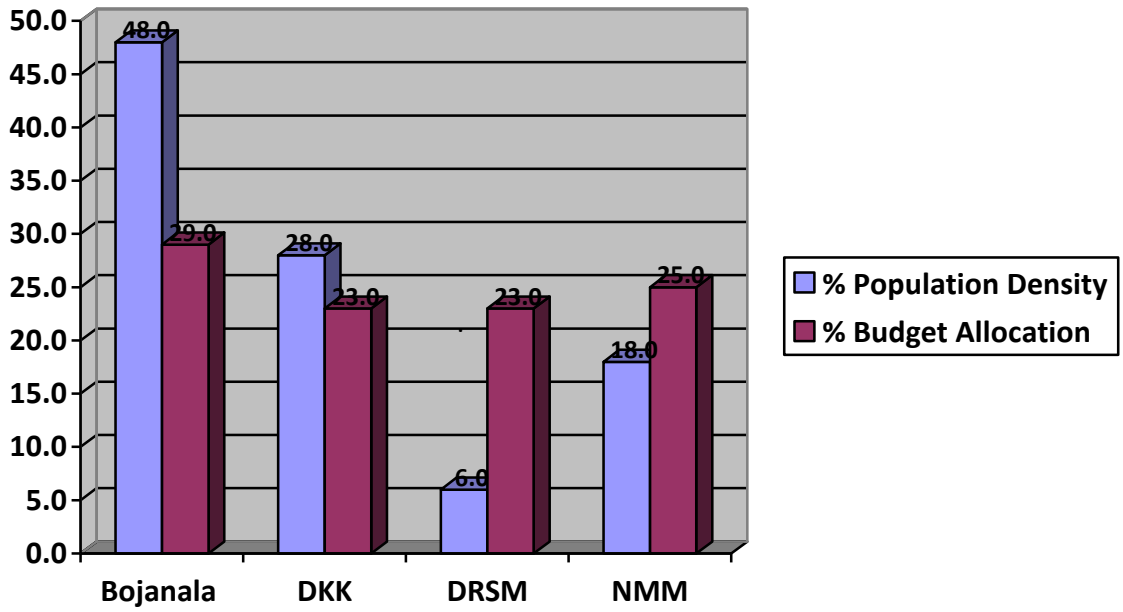
Chart 14: Budget allocation



Based on the information on the population density of **Chart 10**, **Chart 15** shows the relationship between population density and the budget allocation. This shows that Bojanala is under-resourced whilst Dr Ruth Segomotsi Mompati is over-resourced. Ngaka Modiri Molema is slightly over-resourced whilst Dr Kenneth Kaunda is somewhat under-resourced. This relationship is similar to the correlation

between population density and ambulance distribution. The problem in respect of budgeting is that the North West Province does not use a zero-based but a historical budget. Thus areas that have historically been over-resourced remain that way.

Chart 15: Population density vs. budget allocation



1.4 RESEARCH QUESTIONS

1.4.1 What is the present understanding of the work environment of the Emergency Medical Care Practitioner in the North West Province?

1.4.2 Does the Emergency Medical Care Practitioner understand what is expected from them to reduce response times?

1.4.3 Does the Emergency Medical Care Practitioner understand what level of skills development is required?

1.4.4 Does the Emergency Medical Care Practitioner understand what other factors could also improve the quality of Emergency Medical Care?

1.5 HYPOTHESIS

Emergency Medical Care Practitioners in the employment of the Emergency Medical Services in the North West Province do not have an adequate understanding of the Emergency Medical Services delivery environment or the necessary motivation, resulting in slow response times and poor patient care.

The central theoretical assertions are that specific challenges exist within the North West Province that hampers Emergency Medical Care service delivery, namely:

1.5.1 The ineffective and inefficient management of resources, especially in an essential service such as Emergency Medical Services, is one of the critical factors in the lack of mission success.

1.5.2 Inefficient and ineffective service delivery can only be improved if management guidelines and approved plans are implemented.

1.5.3 The non-integrated use of resources is a challenge, as the Emergency Medical Services are divided into different Districts. The said resources will have to be controlled and managed to ensure uniform norms and standards. The utilization of a single governance structure is essential.

1.5.4 Monitoring and Evaluation (M&E) system utilisation at all levels of management of the Emergency Medical Services is crucial to their success.

1.5.5 It is imperative for the Emergency Medical Care Practitioner to have a holistic understanding of the Emergency Medical Care service delivery environment in order to ensure its success.

1.6 AIM OF THE STUDY

The aim of the study is:

1.6.1.1 To determine, by means of a questionnaire and literature study, the Emergency Medical Care Practitioners' understanding of the emergency service delivery environment in the North-West Province.

1.6.1.2 To determine the Emergency Medical Care Practitioners' understanding of the training environment.

1.6.2 To determine the Emergency Medical Care Practitioners' understanding of the factors that affect response times within the North West Province.

1.6.3 To provide Emergency Medical Care Practitioners with a better understanding of the service delivery environment in order to assist with change management.

1.6.4 To formulate and implement strategies to improve service delivery within the Emergency Medical Services.

1.7 Key terms/Concepts

- Needs analysis ;
- Training gaps ;
- Skills development;
- Emergency Medical Services;
- Human resources ;
- Education and training;
- Response times;
- National norms;
- Provincial targets; and
- Patient care.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

A few important aspects seem to be emerging from the literature review. Firstly, the allocation of resources, which would include the location of ambulances or emergency vehicles and secondly the education of the Emergency Care Practitioners. Thirdly, Emergency Medical Services by their very nature cannot effectively function without ambulances, thus it is imperative that vehicles need to be looked at.

2.2 LITERATURE REVIEW

This study is based on a literature review which includes primary and secondary sources to expose accumulative knowledge in the stated field of interest (Ary, Jacobs & Razavieh, 1999:67). A literature review was conducted to understand the main concepts that have been researched.

The norms and standards that are found in Emergency Medical Services were looked at, as this will determine the baseline when the Emergency Medical Care Practitioners are evaluated for performance. Luckett, Ramsey, Prorock-Ernest, Ornato and Ripley (2011:56) state that providers describe their work in research as necessary and critical in order for the field of Emergency Medical Services to grow and move forward. This research looks at the Emergency Medical Care Practitioners with the intention of utilizing the research to effect changes within the service, thereby improving the service.

With reference to the situation in the United States of America, Patterson and Brice (2009:53) state that regardless

of what the overall strategy is for solving a presumed nationwide shortage of Emergency Medical Services workers, a critical aspect to any strategy should be to fill in the gaps between what we know, what we think we know and what we do not know. This has become evident in the research that is being conducted. The situation is the same in South Africa as a shortage definitely exists at a level above the basic levels. In essence, this creates a problem as the level of care that should be provided is not available. Therefore, in some instances the patient does not receive the correct level of care. This research aims at answering some of the questions posed as they relate to the North West Province.

2.3 LOCATION OF RESOURCES

In an Emergency Medical Services environment, the placement or location of a station in relation to its area of service has an impact on response times. The location of a station logically dictates the location of the ambulances. As stations are not normally placed equidistant within a sub-district, it takes longer to get from the station to one end of the district than to the other. Briggs and Bow (2010:52) state that in respect of Emergency Medical Services station construction, location is important primarily in terms of access and response times. Briggs et al. (2010:52) state that when Montgomery County Hospital District was determining where the ambulance station should be, they used demographic mapping software to identify historical call locations and volumes and to plot response time frames. After analysing the data, appropriate areas within the county were pinpointed to receive new facilities. This is a historical problem in South Africa as Emergency Medical Services stations have generally been placed in bigger towns where hospitals and infrastructure exist. This is not the optimal

place for a station to be as there is a rural urban bias. Again, the previous homeland (Bophuthatswana) in the North West generally did not have big towns. Thus most of the resources have been placed in the established old South African towns. This places the resources further away from the larger rural community, which is not only the case with ambulance placement but with hospitals as well, in general with all infrastructure development. If focus is placed at the location of Mahikeng as the provincial capital of the North West Province, it is not in the centre, but is situated more to the northern edge of the Province. Given that it is the provincial capital, most of the administrative resources for Emergency Medical Services are situated in Mahikeng and could be better utilized if they were geographically more centrally placed.

Since the Province is predominately rural, it has to be considered how this rural nature has an effect on response times. Beillon, Suserund, Karlberg and Herlitz (2009:203) conducted research in Sweden and found that rural residents often have limited access to local health care providers and hospitals, which may affect their use of Emergency Medical Services. Further, Beillon et al. (2009:207) stated that it seems that in the more sparsely populated regions the need for ambulances is higher. This is based on information that was confirmed by the ambulance crew. They also found that the fraction of optimal prioritisation was higher in the sparsely populated areas than in densely populated areas. Optimal prioritisation is the prioritisation of calls based on the priority or level of care required by the patient. Thus in the more sparsely populated areas, due to resource constraints, patients are not prioritized correctly and thus do not always receive the correct level of care. The needs of rural communities are higher but they have much less access

to the resources. This is exactly what the Batho Pele principle of access tries to address as the response time in the rural areas is longer. Paragraph 4.3 of the White Paper on Transforming Public Service Delivery, 1997 (Batho Pele White Paper) states that all citizens have a right to equal access to the services to which they are entitled This paragraph in the Batho Pele White Paper also gives further effect to section 27(1)(a) and (3) of the Constitution.

Beillon et al. (2009:209) noted that the operators at the emergency medical call centre seem to be more likely to overestimate patients' need for ambulance response in the urban areas compared with the remote rural area. This situation affects the response times and the number of calls deemed a priority, and seems to have a negative effect on communities in rural areas. Thus, the location of the patient seems to determine his access to quality care. Beillon et al. (2009:209) also showed that the overuse of the Emergency Medical Services is a larger problem in the urban areas than in sparsely populated areas. This may mean that the number of priority responses may not be a true reflection of what the actual responses are. They also showed that the patients who were assessed as not being in need of ambulance transport in urban areas, more often were assessed by the ambulance crew as being able to use a taxi or their own car. This shows that the access and abuse in urban areas is greater, locality thus once again is a determinant in the access to quality care. This also shows that the number of calls made in urban areas is much larger than the number of calls that should be made.

Washko and Heightman, (2012:48) explained that the dispatch system allows Jersey City Medical Centre to put the right resources at the right location to ensure responders are

dispatched quickly for medical emergencies. The intention of this research is to identify any deficits where response times are relatively long and to correct that situation. This could assist the North West Province to adequately place the limited resources that are available. Thus ambulances can be placed at satellite points to ensure that they are closer to the communities they serve.

2.4 EDUCATION

Washko et al. (2012:42) state that for Jersey City Medical Centre to win five prestigious Emergency Medical Services awards, the approach used was to win over the entire staff organization from the ground up by means of education. Education is a big determinant in the quality of care provided to the patient. Education also plays an important role in the understanding of change management. Widmeier (2011:48) agrees with this by stating that vehicle operation is part of our daily jobs, so it is imperative we regularly train in the various techniques to combat the associated complacency that occurs without oversight and training. The complacency referred to is the inability by staff to adhere to prescribed policies, standard operational procedures and guidelines. They may be talking about different areas of Emergency Medical Services, but both agree that education of the practitioner is important. It is important to note that in the research many statements have referred to education.

Washko et al. (2012:43) further state that the next step was to introduce best practices. Washko et al. (2012:44) go on to assert that the end results speak for themselves. Jersey City Medical Centre has improved response times compliance and reliability, as well as survival rates for cardiac arrest and other critical patients. This is the optimal situation for all

Emergency Medical Services and it is the situation that should be aspired to by the North West Province. Emergency Medical Care Practitioners need to understand the environment they work in and the changes that are needed in that area to ensure improvement of the service delivery environment. This can only be achieved with education.

Washko et al. (2012:45) state that this approach forced people to change many of the ways they had traditionally been doing business, especially with their policies and procedures, many of which they never realized they needed. Optimally this is the situation that the North West Province should also expect after this research has been done. The service will not improve if there is no change in the way in which things are done. There has to be a paradigm shift.

2.5 VEHICLES

Emergency Medical Services are highly reliant on vehicles as without an ambulance patients cannot be transported. Therefore the management of vehicles is an important component of Emergency Medical Services' management. Due to the high rate of accidents it is important to change the current practices. It is once again important to note that the research referred to was done in the United States of America due to a lack of research and literature in this field in the South African environment.

Sanddel, Albert, Hansen and Kupas (2008:257) indicate that "vehicle performance standards, improper maintenance, variable operators training and improper safety restraint use have been noted as contributing factors". A similar situation can be found in the Emergency Medical Services in the North

West Province. These factors will have to be addressed to improve the service delivery environment. An electronic system needs to be implemented to ensure that vehicles are managed correctly.

Levick and Swanson (2005:108) showed that "the occupational fatality rate from ambulance crashes is four times the average in the United States when compared to other occupations". The information that is utilized is from the United States as the researcher was unable to find pertinent information in the South African environment. This statistic has not been tested in the South African environment but the information from the North West Province shows a high rate of ambulance accidents as well. This will be discussed at a later stage. Sanddel et al. (2008:258) further support this by stating that "Emergency Medical personnel are at a higher crash risk than other first responders including law-enforcement officers and fire-fighters".

In the literature there are suggestions of how to decrease the number of accidents within Emergency Medical Services. Sanddel, Ward and Stanley (2010:6) state that "Emergency Medical Care dispatchers should be promoted to encourage the non-use of warning devices (lights and sirens) during response to non-life threatening emergency scenes". Ray and Kupas (2005:412) argued that "one of the most effective methods of reducing such crashes is the establishment and enforcement of a complete stop rule at intersections and traffic signals". These proposals should be considered for implementation in the Emergency Medical Services.

2.6 DATABASES CONSULTED

The following databases have been consulted to ascertain the availability of material for the purpose of research:

a) Catalogue of theses and dissertations of South African Universities (NEXUS).
b) Catalogue of books: Ferdinand Postma Library (North West University).
c) Annual Performance Plan of the North West Province Department of Health.
d) Annual reports of the North West Department of Health.
e) North West Emergency Medical Services Training College Library.
f) District Health Information System (DHIS).
g) Google Scholar.

CHAPTER THREE: METHODOLOGY

3.1 RESEARCH DESIGN

Mouton (2001:55) defined research design as a research plan illustrating how the researcher is going to conduct his research. According to Welman, Kruger and Mitchel (2005:52) research design is “a plan according to which the researcher obtains research participants and collects information from them”. The researcher has to show what is going to be done with the participants with a view to making a decision about the research problem.

A quantitative research method will be used in this study. This provided the researcher with the advantage of clearly knowing what to look for. Quantitative research is used to answer questions about characteristics among measured variables with the purpose of explaining, predicting, and controlling phenomena. This approach is sometimes called the traditional, experimental, or positivist approach (Leedy & Ormrod, 2005:94).

This type of research involves identifying the characteristics of an observed phenomenon. Descriptive research is designed to "describe, rather than explain a set of conditions, characteristics, or attributes of people in a population based on a measurement of a sample" (Alreck & Settle, 1985:408).

3.2 SAMPLING

Unrau, Gabor and Grinnell (2007: 280) define probability sampling as a "sampling procedure in which every member of a designated population has a known chance of being selected for a sample". According to Babbie (2007:111) the population for a study is that group commonly known as persons about whom the researcher wants to draw conclusions. Melville and Goddard (1999:27) also came to the same conclusion by stating that a population is any group that is the subject of research interest. Babbie (2007:205) also states that sampling error is minimized by a large sample and a homogeneous population. Thus, the sample chosen is 226 Emergency Medical Services personnel throughout the province. The total population of Emergency Medical Services staff in the North West Province is 789 (North West Province 2012/13:42). Thus, the sample size is 28.6%. Israel (1992) states that the number of mailed surveys, questionnaires or planned personal interviews can be substantially larger than the number required for a desired level of confidence or precision. A 50% return of questionnaires is expected and thus the expected sample size is 14.3%. However, after collating the usable questionnaires the exact sample size for the research was 12.9%. Israel (2009) states that the less variable (more homogenous) a population the smaller the sample size required. This is the case with this research as the whole sample is from a homogenous population.

A sample is a part of something larger, called a population; the latter is the totality of entities in which we have an interest, i.e. the collection of individuals, objects or events about which we want to make inferences (Diamantopoulos & Schelgelmilch, 2005:10). Melville et al. (1999:27) state that

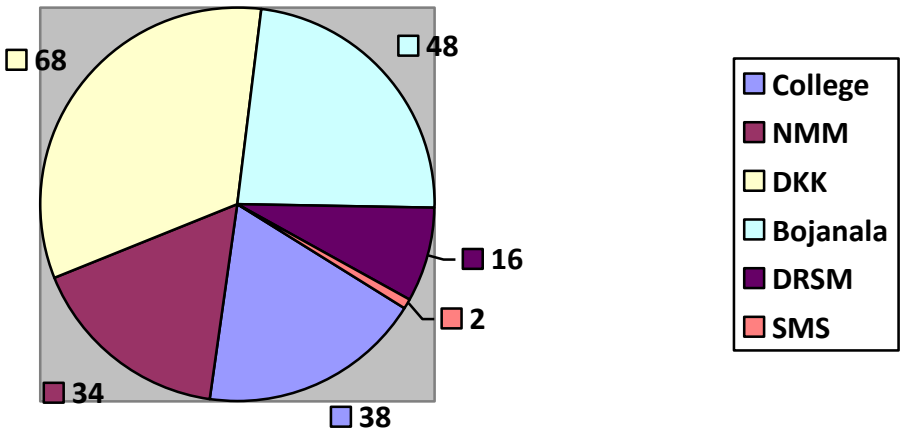
a sample must be large enough to represent a population correctly. As the sample size is greater than 10% the researcher is of the opinion that the sample size is sufficient.

In the case of this research, the smaller sample assisted in an easier analysis of the data, thus resulting in a more manageable process.

The sample will be from one station per District, the Emergency Medical Services Training College and the Senior Management Services. They will be broken down, as indicated in **Chart 16**, as follows:

- 60 staff members at the Emergency Medical Services Training College in Orkney;
- 2 staff members from the Senior Management Services;
- 16 staff members at the Mamusa Emergency Medical Services Station in Doctor Ruth Segomotsi Mompati District;
- 68 staff members at the Matlosana Emergency Medical Services Station in the Doctor Kenneth Kaunda District;
- 34 staff members at the Ramotshere Moilwa Emergency Medical Services Station in the Ngaka Modiri Molema District; and
- 48 staff members at the Moretele Emergency Medical Services Station in the Bojanala District.

Chart 16: Questionnaire breakdown



For the purpose of the study the different areas of Emergency Medical Services will be divided into sections to assist the researcher in collecting data. Each section will answer the same set of questions to accurately evaluate the difference in responses. By further breaking down the sample into different subsets, it allows the researcher to look at all the different aspects of Emergency Medical Services. McIntyre (2005:106) is of the opinion that the researcher must be in the position to explain and defend his or her choice of a particular sampling technique.

The sample will be broken down into different subsets to enable easier interpretation of the data. The subsets are representative of the broader Emergency Medical Services community in the North West Province. The different subsets were chosen for the following reasons:

- The training subgroup provides more accurate data on the issues of skills development;

- The operational and manager subgroups provide better data on response times;
- The student subgroup provides a balanced view of both response times and training issues; and
- The senior manager subgroup provides a more strategic point of view.

These assumptions are made because they refer to the areas of work of the subsets.

3.3 INSTRUMENTATION

The method of research will be predominately in the form of questionnaires posed to subsets of the target population. The target population has been chosen based on their relevance to the research.

Selective interviews were held with pre-eminent members of the Emergency Medical Services community. This will assist in verifying the validity of data obtained. Interviews will be held after the analysis of the information to assist in checking data obtained against current trends in Emergency Medical Services.

3.4 DATA COLLECTION

Data is simply regarded as something a researcher collects and analyses in order to arrive at research conclusions (Blaikie, 2003:15). Once the subsets were identified, sessions were set up with each group individually. The questions were briefly explained. The questions were not discussed, so that the results could not be contaminated. Questionnaires are anonymous and biographical data was collected.

Once questionnaires were collected they were analysed. The data was collated and observations made. These observations were then tested with leaders in the field of Emergency Medical Services to verify their validity. Where disparities exist, further research will be conducted to ensure that perceptions are kept to a minimal.

3.5 DATA ANALYSIS

Mouton (2001:108) comments that all fieldwork culminates in analysis and interpretation with the aim of getting more insight into the constitutive elements of the data collected. Thus, all the data that is collected will be analysed to try and produce solutions to the research question. This is supported by Unrau et al. (2007:134) when defining data analysis as "the process of converting data into information; the process of reviewing, summarizing, and organizing isolated facts such that they formulate meaningful response to a research question".

Data was firstly analysed on biographical data obtained. Data was then further broken down into the different subsets identified. Descriptive data was used to interpret data.

3.6 LIMITATIONS

One of the main drawbacks of questionnaires, especially ones served via mail, is the low response rate (Beiske, 2002:5). Questionnaires are not suited for research that requires a large number of open-ended questions. Questionnaires are also limited by their structure. Thus, the questionnaire has to be structured for ease of interpretation so as to allow the participant to complete it without the assistance of the researcher.

Another limitation was the low number of responses. In addition, not all the respondents filled in the questionnaires correctly, with the result that these questionnaires were not considered.

Because the group selected were not random, but from specific parts of the Emergency Medical Services fraternity, it cannot be ensured that results from a different group of Emergency Medical Services personnel would yield the same results.

3.7 DELIMITATIONS

Delimitations are parameters or boundaries placed on a study by the researcher (Cottrell & McKenzie, 2009:86).In this research, the delimitation was to the Emergency Medical Services in the North West Province of South Africa. Further staff members from three areas were targeted, namely operations, senior management and training. Amongst them training staff lecturers and first-year students were utilized. In operations, junior managers and operational staff with more than five years' experience were used. The senior managers who were used had Emergency Medical Services as part of their job function.

3.8 SIGNIFICANCE OF THE STUDY

Limited research has thus far been done in a South African context. Most of the research in the field of Emergency Medical Services is done in the United States of America and the United Kingdom. Thus, this research aims to obtain a South African perspective.

The National Department of Health has placed emphasis on improving the quality of care of patients by reducing response times and enhancing skills development. Research has not been done to show that these two factors are the largest contributors to the improvement in patient care in the pre-hospital environment.

Finally, very little has been researched on the staff members within an Emergency Medical Services environment. This could help improve the way in which emergency services are delivered.

CHAPTER FOUR: ANALYSIS OF DATA

4.1 QUESTIONNAIRES

The questionnaires were given to the station managers at the selected stations for completion and to the college principal at the training college for distribution and collection. Specific stations were selected from the Emergency Medical Services stations in the Province. One station was chosen in each of the four Districts. The selection of the stations was based on the efficiency of the station's management as they would have to ensure the maximum return of questionnaires. The stations chosen were as per **Table 5** below.

Table 5: Stations chosen

District	Station	Main Town
Ngaka Modiri Molema	Ramotshere Moilwa	Zeerust
Dr Kenneth Kaunda	Matlosana	Klerksdorp
Bojanala	Moretele	Moretele
Dr Ruth Segomotsi Mompati	Lekwa Temane	Bloemhof

The total population of Emergency Care Practitioners in the Province at the time of the distribution of the questionnaires was 752. The number of questionnaires was the same as the number of Emergency Medical Care Practitioners in that specific area. Thus, each person in the sample area was given a questionnaire that is 228 questionnaires were handed out and 163 were returned, which is a 71.5% response rate. Of the 163 questionnaires received some were incomplete and could therefore not be used for

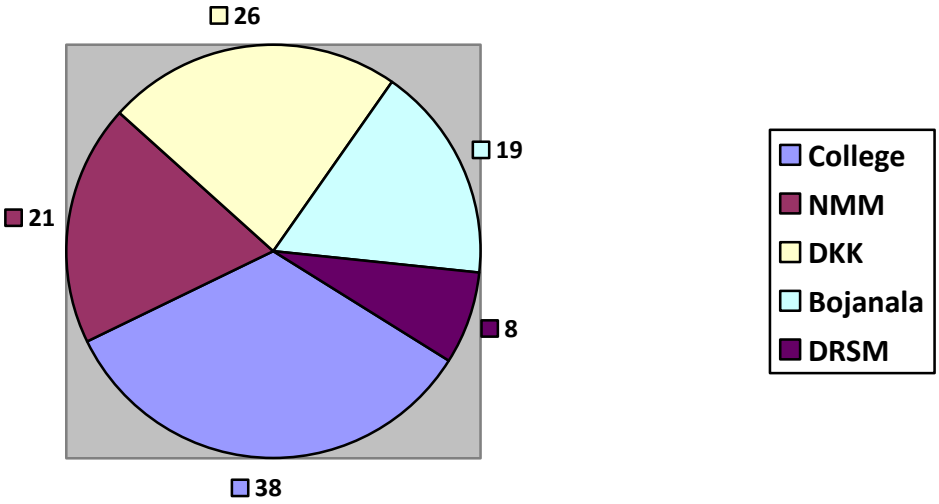
numerous reasons. In the biographical data section some respondents did not fill in their race and/or gender. In the question section some respondents either did not answer the entire questionnaire or placed a double mark at some questions. After the spoiled questionnaires were eliminated, 112 were used which yielded a response rate of 49.1%. The true sample size of the total Emergency Medical Services population was therefore 14.9%. The projected response rate was 14.3%. This can be seen in **Table 6** below. SurveyMonkey states that a response rate of 10 to 15% is a more conservative and safe guess if you have not surveyed the population before. It also states that a 20 to 30% response is highly successful. Checkmarket states that if you do an online survey then 20% is a good response rate. As this was the first time that this population was surveyed the response rate of 14.9% is acceptable.

Table 6: Questionnaires collected

		Questionnaires given out	Questionnaires returned	Questionnaires usable
EMS Training College	No.	60	50	38
	%	100	83.3	63.3
NMM	No.	36	34	21
	%	100	94.4	52.8
DKK	No.	68	40	26
	%	100	58.8	38.2
Bojanala	No.	48	26	19
	%	100	54.1	39.6
DRSM	No.	16	13	8
	%	100	81.3	50
Total	No	228	163	112
	%	100	71.5	49.1

The usable questionnaires were distributed per area as shown in **Chart 17**. The majority of the respondents were from the Training College and the Matlosana station in Doctor Kenneth Kaunda. The college is situated in the Doctor Kenneth Kaunda District and, therefore, more respondents are from that District. This is, however, not a true reflection as the students at the Training College are selected from various stations within the Province.

Chart 17: Breakdown of usable questionnaires



4.2 BIOGRAPHICAL DATA

Biographical data was looked at to assist the researcher to understand who the respondents are. Biographical data is also important to the Provincial Department of Health, as it could be used to measure if it is achieving its targets in the areas of affirmative action as well as gender equality in this occupational field.

Of the biographical data the following information is of significance.

4.2.1 Age distribution

The analysis shows a large percentage of Emergency Medical Care Practitioners within the 26 to 35-year age group. This is 45.5% of the total. There are no Emergency Medical Care Practitioners within the 56 to 65- age groups. This is due to the fact that Emergency Medical Services only started in the North West Province in 2001. Of the staff 92.8% are thus below 45 years of age. This indicates a

service with relatively young staff members. Prior to Emergency Medical Services becoming a provincial service, it was delivered at local government level, attached to the numerous Fire Departments. Most of the provinces that made up the former “Transvaal Province” are in the same situation. All the services in the previous Transvaal were municipal services. Thus, the situation is similar in the North West, Mpumalanga and Limpopo. Gauteng is an exception as the Emergency Medical Services are still not a provincial service but are rendered at municipal level.

The large number of Emergency Medical Care Practitioners below 35 years of age at the College is due to the large student population studying Emergency Medical Services related courses, the figure being 73.68%. This figure would have been higher but many students filled in the questionnaire incorrectly. It should be noted that the students at the Training College are Emergency Care Practitioners who are employed by the Province and are there to improve their skills sets. Moreover, all students at the Training College are registered with the Health Professions Council of South Africa. **Table 7** presents a complete breakdown of the age distribution amongst Emergency Medical Care Practitioners that completed the questionnaire correctly.

Table 7: Age analysis

Age range	EMS Training College	NMM	DKK	Bojanala	DRSM	Total	
18-25	10	0	0	4	0	14	12.5%
26-35	18	10	14	9	0	51	45.5%
36-45	9	8	9	5	8	39	34.8%
46-55	1	3	3	1	0	8	7.2%
56-65	0	0	0	0	0	0	0%
Total	38	21	26	19	8	112	100%

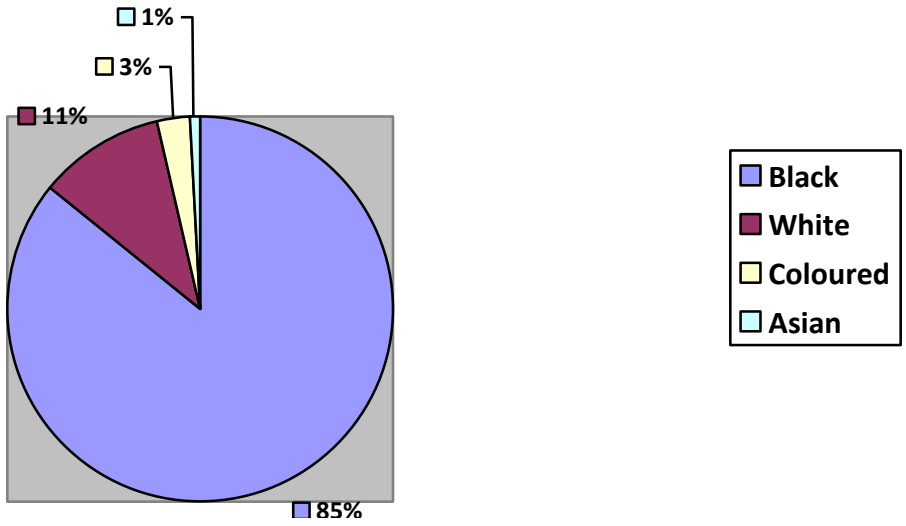
4.2.2 Race distribution

The analysis of the data shows a predominance of black staff that completed the questionnaire at 85.7%. This is shown in **Table 8** and **Chart 18** below.

Table 8: Race distribution

		Black	White	Coloured	Asian	Total
EMS Training College	No.	31	7	0	0	**38**
	%	27.7	6.3	0	0	**33.9**
NMM	No.	15	8	3	1	**27**
	%	13.4	7.1	2.7	0.8	**24.1**
DKK	No.	23	3	0	0	**26**
	%	20.5	2.7	0	0	**23.2**
Bojanala	No.	19	0	0	0	**19**
	%	16.9	0	0	0	**16.9**
DRSM	No.	8	0	0	0	**8**
	%	7.1	0	0	0	**7.1**
Total	No.	**96**	**18**	**3**	**1**	**112**
	%	**85.7**	**16.1**	**2.7**	**0.8**	**100**

Chart 18: Race analysis



The above percentage is less than the race distribution of Emergency Medical Care Practitioners within the Province as per the Personnel and Salary System (PERSAL) (June 2013), which is 94.5% black. **Table 9** hereunder indicates that the result were as follows:

Table 9: Race distribution NWP EMS 2013

		Black	White	Coloured	Asian	Total
Province	No.	742	27	14	2	**785**
	%	94.5	3.5	1.7	0.3	**100**

Thus the staff numbers that completed the questions do not correspond to the racial breakdown of staff employed. However, this is due to the fact that more unusable questionnaires were from Black staff members. This created the problem of a shortage of Black respondents. The racial breakdown within an institution should reflect the racial composition of the population of that particular province. According to the National Census of 2011, 89.8% in the North West Province (StatsSA, 2012:16) are Africans. Thus, there is a 4.09% under-representation of Africans according to this research. According to the Affirmative Action criteria each department should reflect the racial breakdown of that province, and ideally this should be reflected within each directorate in that department. The 2011 census data indicates that there are 7.3% Whites in the Province; whereas 16.1% of the respondents were White. This is an 8.8% over- representation. Census 2011 also indicates that there are 0.4% Coloureds and 0.6% Asians in the province. The Coloured and Asian respondents were 2.7% and 0.8%

respectively, thus there is also an over-representation of both race groups. The predominance of White respondents, in relation to the demographics of the Province, is due to the fact that all the white respondents filled in the questionnaire correctly.

As can be seen from the sample in Bojanala and Doctor Ruth Segomotsi Mompati, as an example, no other races besides Black Africans are employed.

The race distribution of Emergency Medical Care Practitioners within the Province as per the Personnel and Salary System (PERSAL) (June 2003), is shown in **Table 10** below.

Table 10: Race distribution NWP EMS 2003

		Black	White	Coloured	Asian	Total
Province	No.	474	43	16	1	**534**
	%	88.8	8.1	2.9	0.2	**100**

This shows that there has been a 5.7% increase in black staff members in Emergency Medical Services in ten years.

4.2.3 Gender distribution

The analysis shows that the respondents are 25% female. This is less than the gender distribution of Emergency Medical Care Practitioners within the Province as per the PERSAL (June 2013), which is 43.1% female shown in **Table 11** below.

Table 11: Gender distribution per area NWP EMS 2013

		Male	Female	Total
EMS Training College	No.	447	338	**785**
	%	56.9	43.1	**100**

Emergency Medical Services have historically been a male-dominated field. There has been an active process in the North West Provincial Emergency Medical Services since 2003 to employ more females. The increase in the number of females in the last ten years has thus been 8.3%. This is reflected in **Table 12** hereunder.

Table 12: Gender distribution per area NWP EMS 2003

		Male	Female	Total
EMS Training College	No.	348	186	**534**
	%	65.2	34.8	**100**

There is thus an 18.5% under-representation of females in the research. The gender breakdown in the whole Department of Health in the North West Province is 71.6% female. The gender norm for the Department should be 50% female. On average, the Department is well above its target due to the predominance of females in the nursing profession and the fact that nurses make up the largest part of the workforce. Emergency Medical Services are under that target by just 6.9%. **Table 13** below indicates the gender distribution per area identified.

Table 13: Gender distribution per area

		Male	Female	Total
EMS Training College	No.	37	1	**38**
	%	33	0.8	**33.9**
NMM	No.	15	6	**21**
	%	13.4	5.4	**18.7**
DKK	No.	15	11	**26**
	%	13.4	9.8	**23.2**
Bojanala	No.	14	5	**19**
	%	12.5	4.5	**16.9**
DRSM	No.	3	5	**8**
	%	2.7	4.5	**7.1**
Total	No.	84	28	**112**
	%	75	25	**100**

4.2.4 Length of service

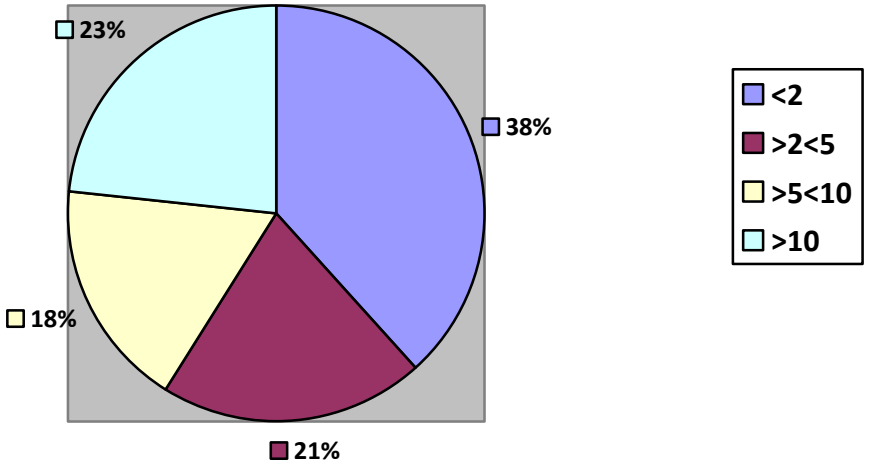
The analysis shows a predominance of staff with less than two years' service. This is 38.4% of the total. There seems to be a high turnover of staff within the Emergency Medical Services. A further reason may be the fact that a large number of the respondents who filled in the questionnaires came from the student population. Of all staff, 58.9% have less than five years' service. Only 23% of staff has over 10 years' experience. This is consistent with the age distribution which indicated that the service is relatively young and inexperienced. Ideally, the service should have at least 50% of staff who have more than 10 years' experience. The large percentage of staff with a higher level of service results in a more experienced workforce. Also, the older cadre imparts knowledge to the newer members of staff.

Emergency Medical Care Practitioners in the urban areas gain experience quicker than staff in the rural areas. This is due to the fact that the case loads in urban areas are higher. Thus the Emergency Medical Care Practitioner does not only see more patients but also deals more with different kinds of patients. **Table 14** below is an indication of this; and a graphical representation is provided in **Chart 19**.

Table 14: Length of service

		<2	>2<5	>5<10	>10	Total
EMS Training College	No.	27	3	2	6	**38**
	%	24.1	2.7	1.7	5.3	**33.9**
NMM	No.	3	7	6	5	**21**
	%	2.7	6.3	5.3	4.5	**18.7**
DKK	No.	6	5	9	6	**26**
	%	5.3	4.5	8	5.3	**23.2**
Bojanala	No.	7	6	2	4	19
	%	6.3	5.3	1.7	3.6	16.9
DRSM	No.	0	2	1	5	8
	%	0	1.7	0.8	4.5	7.1
Total	No.	43	23	20	26	112
	%	38.4	20.5	17.8	23.2	100

Chart 19: Length of service



4.2.5 Operational skills level of staffing

The analysis shows that 58% of the questionnaires were filled in by operational staff (meaning staff members that are qualified and working in ambulances), followed by students at 25.9%. Thus together these two categories account for 83.9% of all respondents. This is in line with the staffing in the North West Emergency Medical Services as the majority of staff employed is operational staff. **Table 15** below reflects this information with a graphical representation in **Chart 20**.

Table 15: Operational skills level per area

		Operations	Emergency Medical Services management	College Management	SMS	Student	Total
EMS Training College	No.	0	0	9	0	29	38
	%	0	0	8	0	25.9	33.9
NMM	No.	18	1	0	2	0	21
	%	16	0.8	0	1.7	0	18.7
DKK	No.	24	2	0	0	0	26
	%	21.4	1.7	0	0	0	23.2
Bojanala	No.	17	2	0	0	0	19
	%	15.1	1.7	0	0	0	16.9
DRSM	No.	6	2	0	0	0	8
	%	5.3	1.7	0	0	0	7.1
Total	No.	65	7	9	2	29	112
	%	58	6.3	8	1.8	25.9	100

Chart 20: Skills level

*

4.3 ANALYSIS OF STATEMENTS

The statements posed in the questionnaire were analysed. Each statement was considered individually, but some statements were also grouped together to gain a better interpretation. Some of the statements relate to the same area and are therefore considered collectively.

A five-point Likert scale was used in the questionnaire to determine the response. The scale ranged from 'Totally Disagree' to 'Totally Agree', with the middle (3) being 'Neutral'.

When the data was analysed it was noted that in most areas a large number of respondents were neutral. It is important to understand that respondents who are neutral are neither positive nor negative. A neutral response may be viewed as negative but should not be seen in that light. There is a possibility that the respondent may just be satisfied with the way things are, or they may just not be sure about how they feel about that particular question. Another option may be that the respondent may not understand the question and thus remained neutral.

These questions were divided into five different areas, namely training, staffing levels of ambulances, response times, and medical qualification and warning devices

4.3.1 Training

Training is the backbone of any medical service. In the Emergency Medical Services, training is not only of a medical nature but driver and administrative training is also provided and regarded as important. As training is dealt with under a separate heading the researcher will clarify what type of training is referred to in the questionnaire statement. The Health Professions Council of South Africa has initiated a programme of Continuous Professional Development (CPD) that ensures that throughout a medical professional's career, medical professionals have to constantly update themselves with the latest developments in the medical field.

The following statements in the questionnaire requested the respondents to consider and respond to:

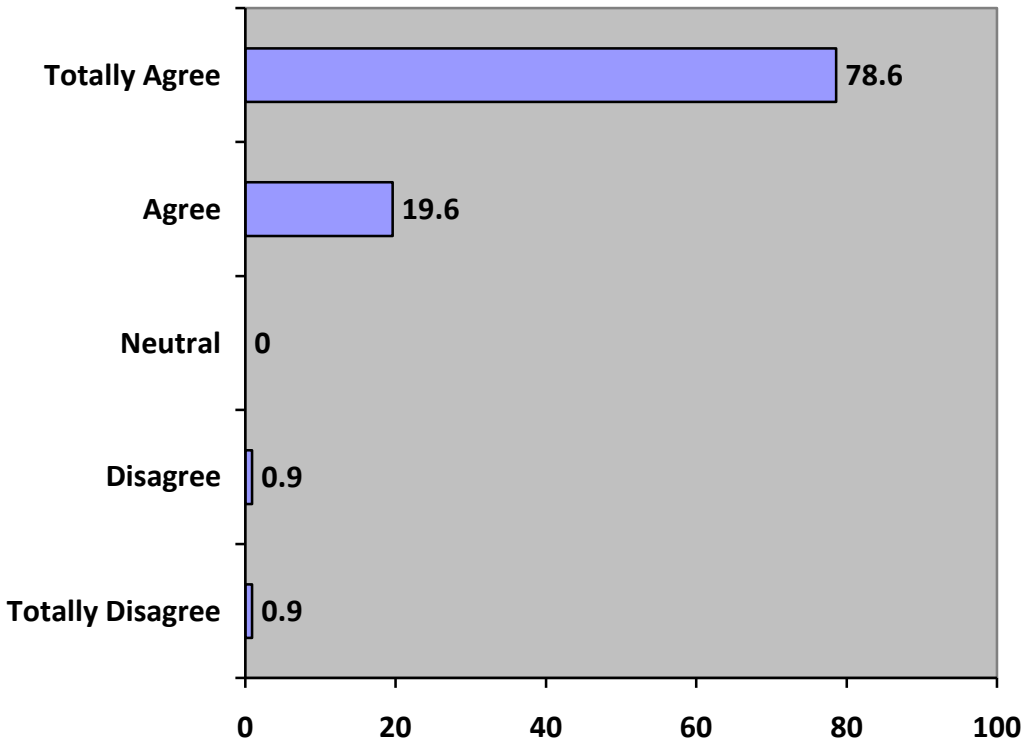
- Training will improve patient care;
- An increase in the number of emergency vehicles will improve patient care;
- Training in the province is sufficient;
- Training is accessible to staff members;
- Training will improve response times;
- Training will improve driving skills;
- Training will improve the survival rate of patients;
- Training will improve the understanding of Emergency Medical Services.

4.3.1.1 Training will improve patient care

In the area of patient care, this would mean that if the training of the Emergency Medical Care Practitioner was at a higher level, then the level of service given to the patient would be better. This type of training is purely medical in nature. It is logical that if the level of staff qualification is improved, then the level of care delivered to patients should improve. This is the basis for the referral of patients from one health institution to the next. A patient is, for instance, referred from a clinic to a hospital if the staff member at the clinic does not possess the necessary training to treat the patient. In this instance the patient is transported by Emergency Medical Services. To clarify the statement with regard to the Emergency Medical Services environment, medical training relates to an improvement in skills as the training is skills based. It should, however, be noted that most of the respondents do have a Basic Life Support qualification.

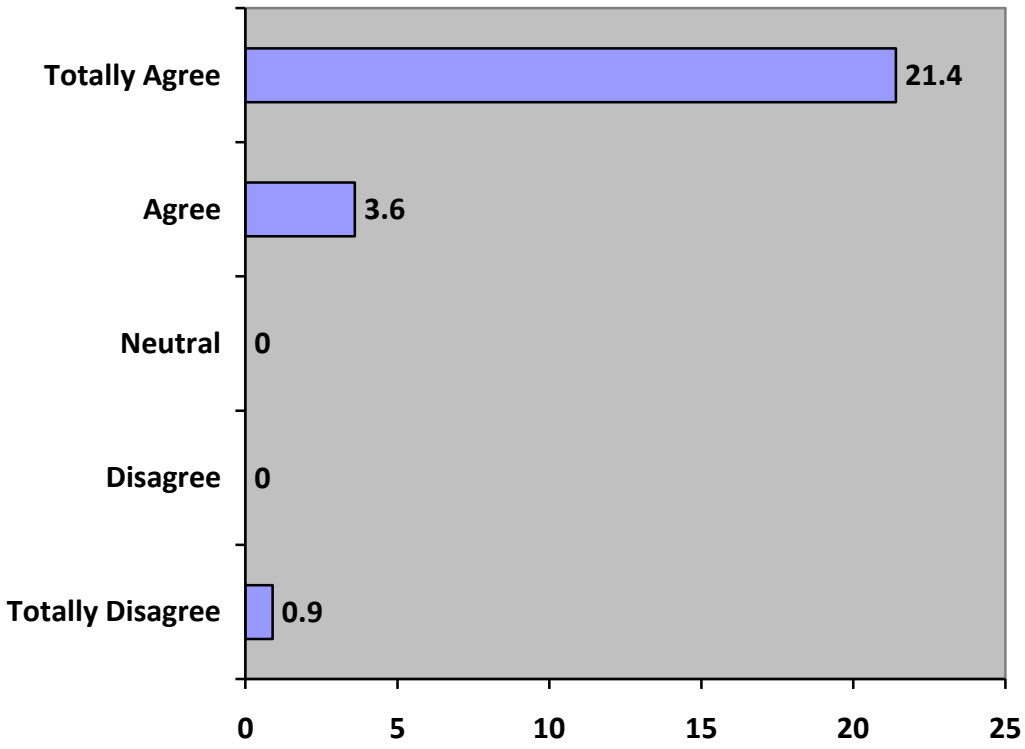
The responses give the impression that the respondents have an understanding of the correlation between improvements in their training and the effect on patient care. The respondents were overwhelmingly positive, with 76.8% totally agreeing and 19.6% agreeing. Thus, 98% of respondents reacted positively. The negative responses from respondents were very low, with 0.9% disagreeing and 0.9% totally disagreeing. Thus, 1.8% of the respondents reacted negatively. This is shown in **Chart 21**, below.

Chart 21: Training will improve patient care



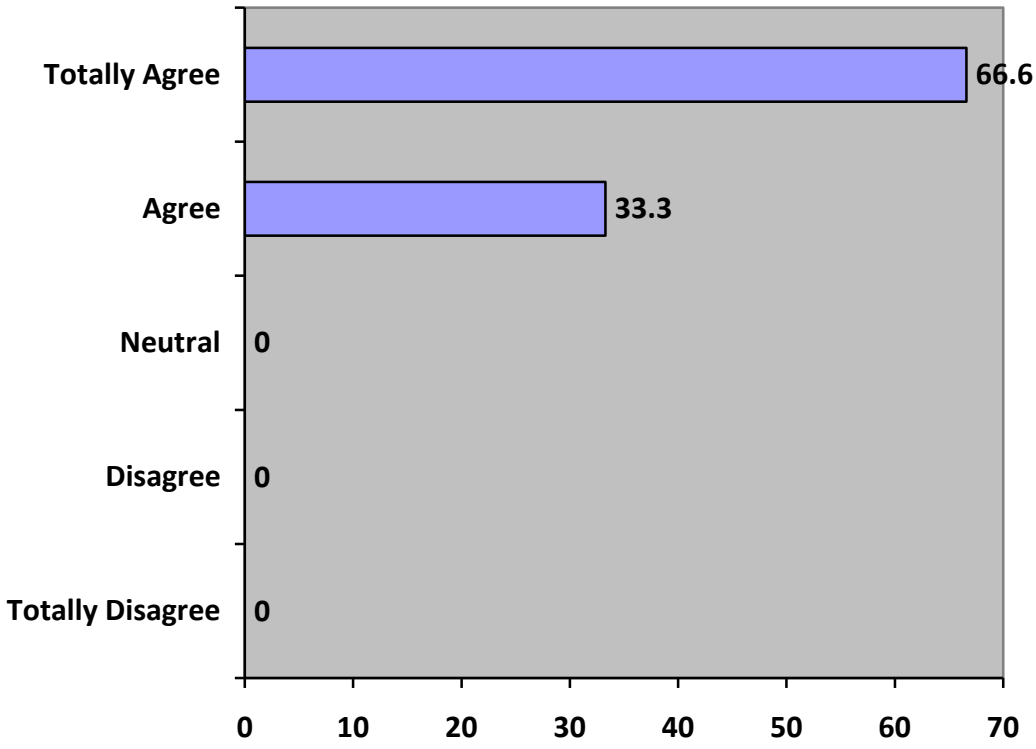
It could be said that the student group, shown in **Chart 22**, with a response of 82.76% totally agreeing and 13.79% agreeing, could be regarded as 96.55% positive about the effect of training on their skills. A 100% agreement with the statement was expected from students as they are presently on a training programme to improve their medical skills level.

Chart 22: Training will improve patient care (student group)



As expected, 100% of the College Management group were positive as indicated in **Chart 23**. This is the anticipated result as there should be a correlation between training and improved patient care. Cooper, Barrett, Black, Evans, Real, Williams and Wright (2004:614) concur with the statement by saying that "care benefits were increased especially relating to immediacy of treatment and referral mechanisms", which relate to training. The higher the skills level of staff, the better patient care should be.

Chart 23: Training will improve patient care (College Management group)



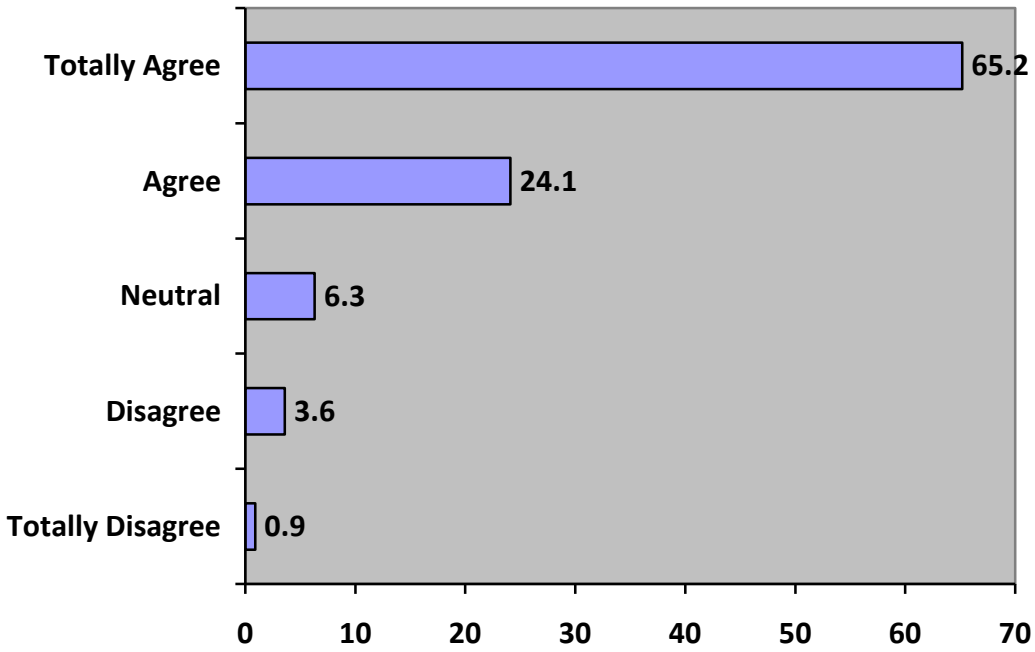
4.3.1.2 An increase in the number of emergency vehicles will improve patient care

With regard to the number of vehicles, it would mean that if more emergency vehicles were available at a given time, there would be no delay in dispatching a vehicle to the patient when the call was received. In other words, an emergency vehicle would get to the patient sooner. The skills required in this instance by the Emergency Medical Care Practitioner are driver training skills. Thus the patient would receive care sooner. There is, however, a concern about the management of Emergency Medical Services vehicles and the utilization of the correct vehicle that is dispatched to the location. The concern is based on the performance of the Emergency Medical Services as measured in the annual reports of the North West Department of Health. To have a large fleet of vehicles that

is not effectively controlled and monitored does not make the utilization of that resource more effective.

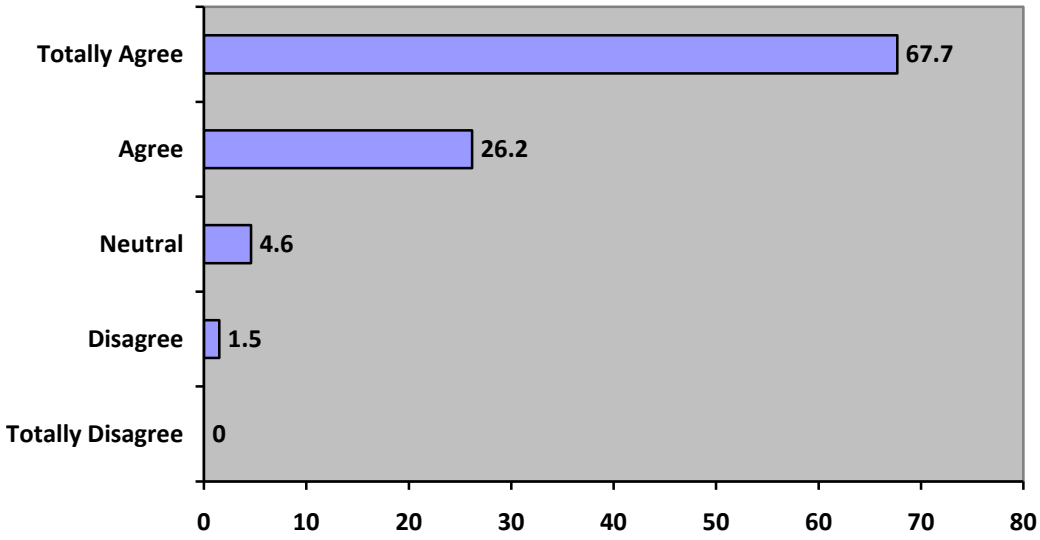
The respondents generally agreed with the statement that the availability of more Emergency Medical Services vehicles will improve response times. The results show that as Emergency Medical Services are a vehicle-based system, the function cannot be carried out without sufficient vehicles. However, as stated earlier, these vehicles need to be accurately monitored, controlled and maintained. It also needs to be emphasized that with the current budget constraints only a finite number of vehicles are available. The respondents were overwhelmingly positive, with 65.2% totally agreeing and 24.1% agreeing. Thus 89.3% of respondents reacted positively. The negative responses from respondents were very low, with 3.6% disagreeing and 0.9% totally disagreeing. Therefore 4.5% of the respondents reacted negatively, with 6.3% being neutral. This is shown in **Chart 24** below.

Chart 24: Increase in number of emergency vehicles will improve patient care



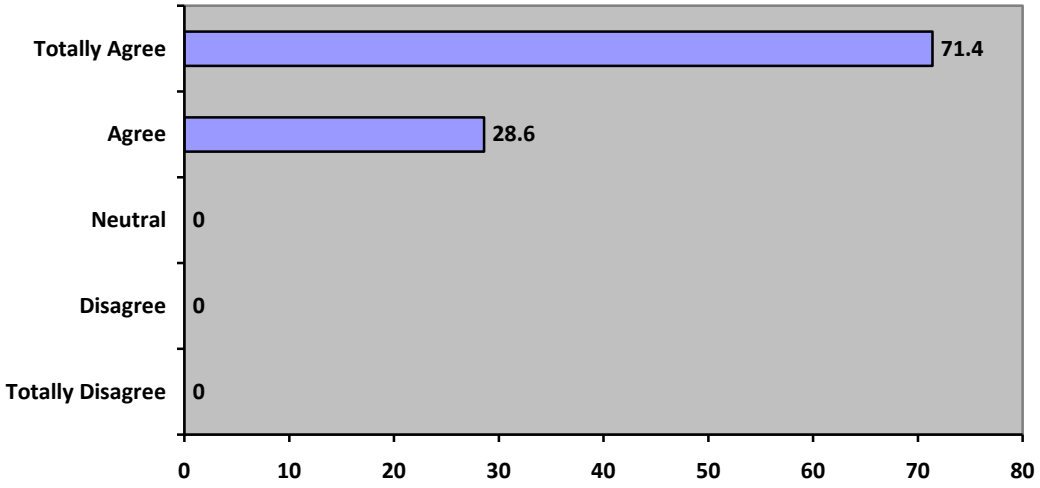
The group to whom this applies in particular is the operational staff. The respondents were overwhelmingly positive, with 67.7% totally agreeing and 26.2% agreeing. Thus 93.9% of respondents reacted positively. The negative responses from respondents were very low, with 1.5% disagreeing and no respondents totally disagreeing. Therefore only 1.5% of the respondents reacted negatively, with 4.6% being neutral. This is shown in **Chart 25** below.

Chart 25: Increase in number of emergency vehicles will improve patient care (operational staff group)



The Emergency Medical Services management group is positive as they view this from an operational point of view. The respondents were positive, with 71.4% totally agreeing and 28.6% agreeing. Thus 100% of respondents reacted positively. This is shown in **Chart 26** below

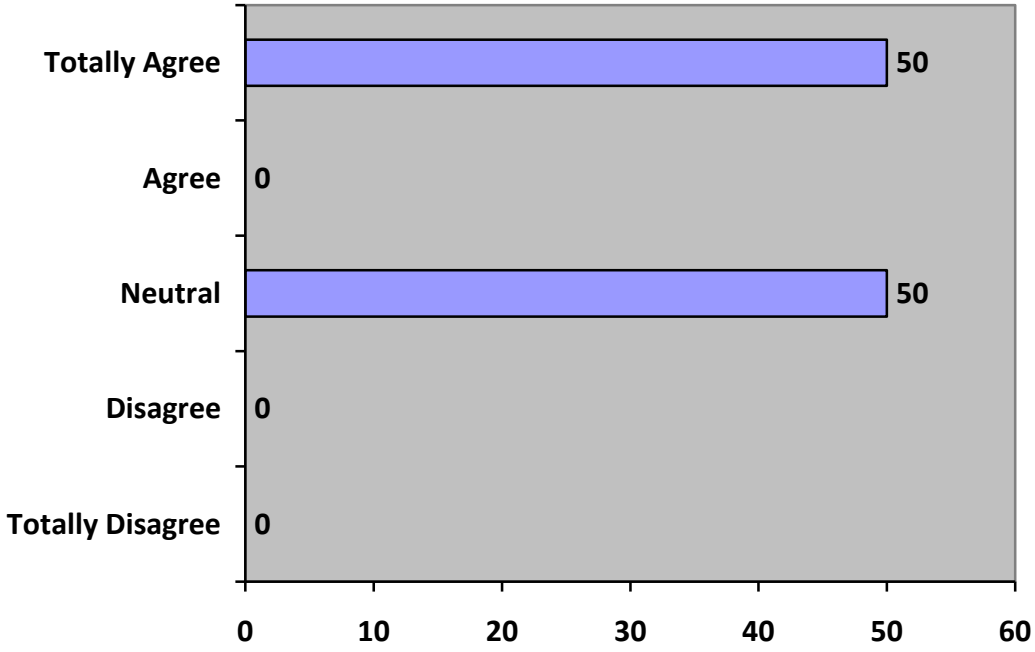
Chart 26: Increase in number of emergency vehicles will improve patient care (EMS management group)



From a strategic point of view the Senior Management Service group are 50% neutral and 50% totally agree, as indicated in **Chart 27** below. This may show that they are

also considering other factors, such as an effective Emergency Medical Dispatch System, as well as a vehicle tracking system. This assumption is based on discussions held with the Senior Management Service group as they are a very small group and easily identifiable.

Chart 27: Increase in number of emergency vehicles will improve patient care (SMS group)

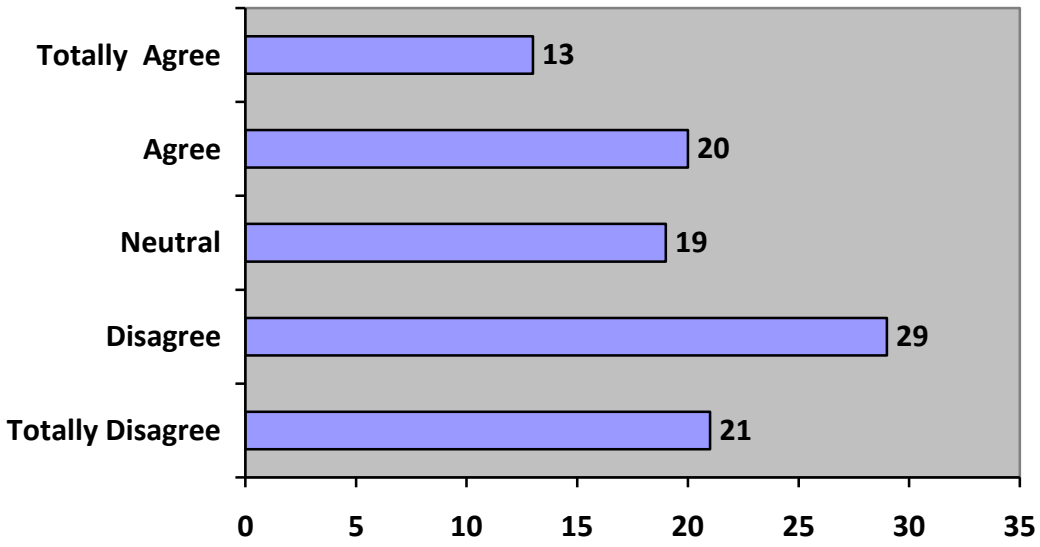


4.3.1.3 Training in the province is sufficient

The statement “training is sufficient” was meant to elicit from the respondents whether it was their personal opinion that the training provided would be adequate for their personal development. The training in this instance is both medical and driver training. This enquiry also seeks to measure whether Emergency Medical Care Practitioners understand and are aware that continuous training programmes are necessary before there is an impact upon normal operation. Training may be provided for individuals but unless they are committed and dedicated to their job there will still be a problem.

In response to the statement whether respondents regard training as sufficient for the improvement of services it seems that they require further training to fulfil their needs. The amount of training that is done has financial implications and has to fit into the budget envelope. It is impossible for an institution to train all the staff members in a given financial year and thus there would have to be a sorting criterion. These criteria would benefit certain individuals and not others. This could lead to negative replies by respondents. Of the respondents 30% totally agreed and 19% agreed. Thus, 49% of the respondents reacted positively. Also, 29% disagreed and 21% totally disagreed. Therefore, 50% of the respondents reacted negatively and 19% were neutral. This is shown in **Chart 28** below.

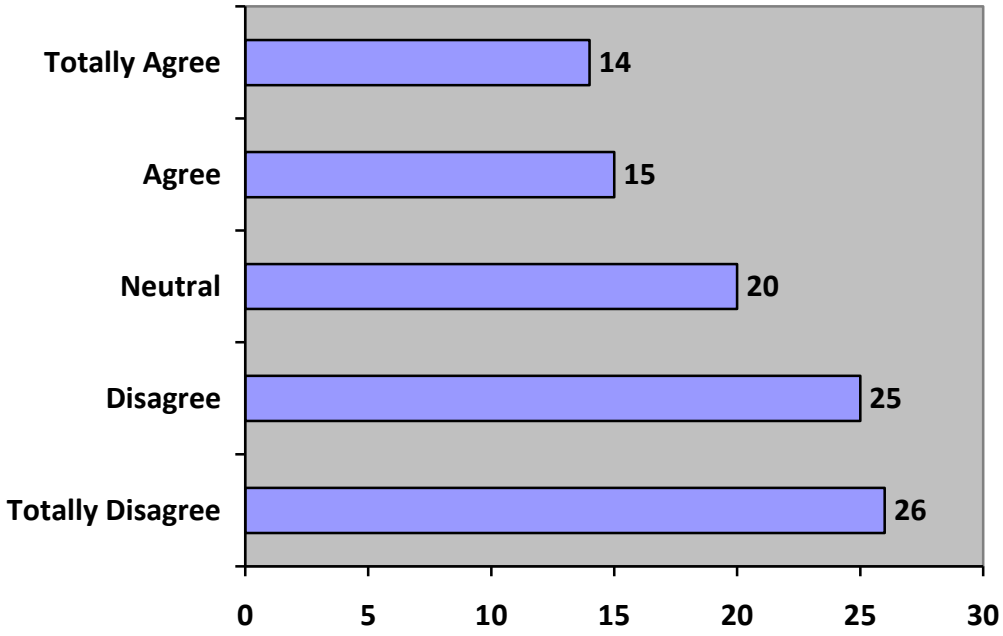
Chart 28: Training in the province is sufficient



The training needs are normally put forward by the operational staff as this is where the actual patient care is provided, and it is therefore important to look at the operations subgroup. There seems to be more dissatisfaction the lower the salary scale and management level of the staff member. Thus the lower levels of staff feel that they need more opportunities for training, whilst the staff at a higher level may understand the budgetary and time constraints that exist. There may be a lack of understanding at the lower levels of the existing constraints with regard to training. This response could either be due to misunderstanding the question or the fact that training is an emotional issue as it affects the pocket of the individual. In the Emergency Medical Services there is a salary increase with an increase in qualification, thus staff are well motivated to train. Most operational staff has a need for training as they see it as an opportunity for personal growth and financial gain. The Occupational Services Dispensation (OSD) links the salary level of an individual in the Emergency Medical Services to his level of qualification.

Of the respondents 14% totally agreed and 15% agreed. Thus, 29% of respondents reacted positively. Also, 25% disagreed and 26% totally disagreed. Therefore 51% of the respondents reacted negatively, with 20% being neutral. This is shown in **Chart 29** below.

Chart 29: Training in the province is sufficient (operational staff)

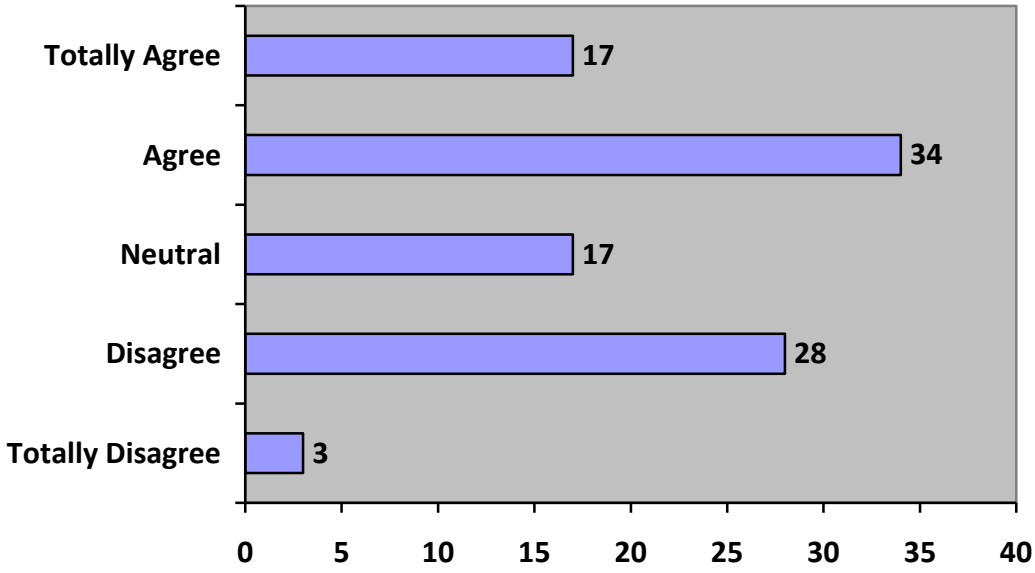


The student subgroup displays a slightly different picture, which is rather more positive. This may be that the student group is presently in training and feels that their needs are being met. This subgroup is doing a tertiary qualification and is undergoing training for a two-year period. The researcher would expect students who are in training to have an overwhelmingly positive response. The large negative response and the neutral responses are thus surprising. The researcher is led to believe that the student subgroup did not fully understand the question, and thus the negative response.

Of the respondents 17% totally agreed and 34% agreed. Thus, 51% of respondents reacted positively. Also, 28%

disagreed and 3% totally disagreed. Therefore 31% of the respondents reacted negatively, with 17% being neutral. This is shown in **Chart 30** below.

Chart 30: Training in the province is sufficient (students)



The responses are surprising as the researcher could understand the mixed reaction from operational staff since some may have been on a training course recently and others may not have been in training in a while. This would be the result as only a percentage of staff can be developed at any given time because whilst training is important, service delivery may not be hampered. On average there is a relatively neutral response with operational staff generally expressing a negative opinion and students generally expressing a more positive opinion.

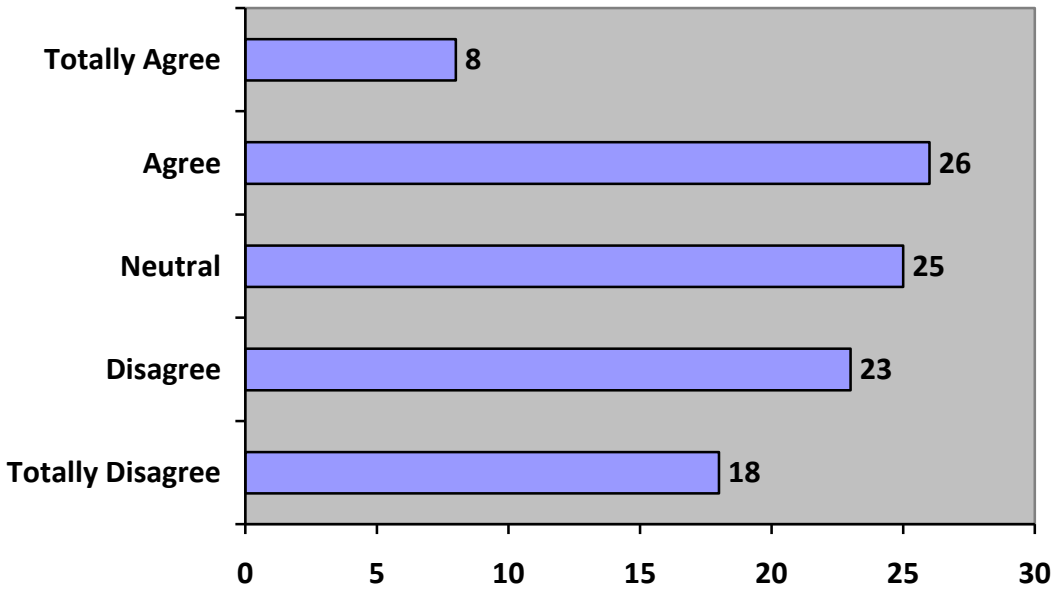
4.3.1.4 Training is accessible to staff members

With regard to the accessibility to training opportunities, the respondents were required to state whether they personally feel that they have the opportunities to access training. The type of training in this instance is not specific, but refers to

training in general. This is different from the training being sufficient as this is a personal issue on how each respondent accesses training or perceives the accessibility to training.

Of the respondents 8% totally agreed and 26% agreed. Thus, 34% of respondents reacted positively. Also, 23% disagreed and 18% totally disagreed. Thus, 41% of the respondents reacted negatively and 25% were neutral. This is shown in **Chart 31** below.

Chart 31: Training is accessible to staff members



It is not surprising that the analysis of both the student and the operational subgroup for this question is similar to statement three. There does not seem to be an understanding of the difference between enough training courses and whether each of these courses is accessible to every individual. There is no correlation between the two sets of answers. A difference between the response to this statement and the response to statement three would be expected.

4.3.1.5 Training will improve response times

The next statement regarding response times was posed to determine whether the respondent feels that with better driver training they would be able to arrive at the patient sooner to apply emergency care.

Of the respondents 43% totally agreed and 42% agreed. Thus, 85% of respondents reacted positively. Also, 4% disagreed and 4% totally disagreed. Thus, 8% of the

respondents reacted negatively and 8% were neutral. This is shown in **Chart 32** below.

Chart 32: Driver training will improve response times

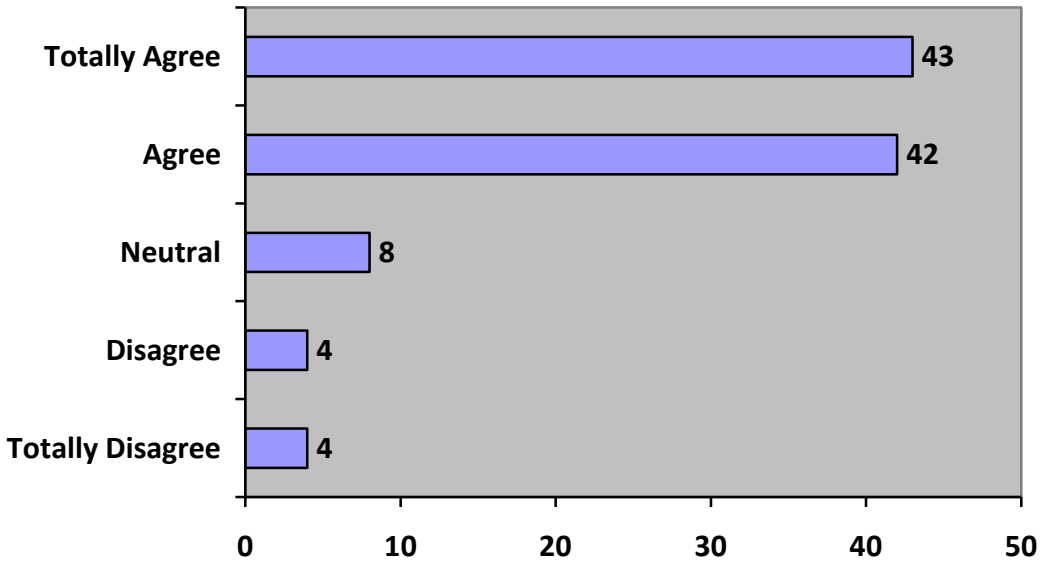
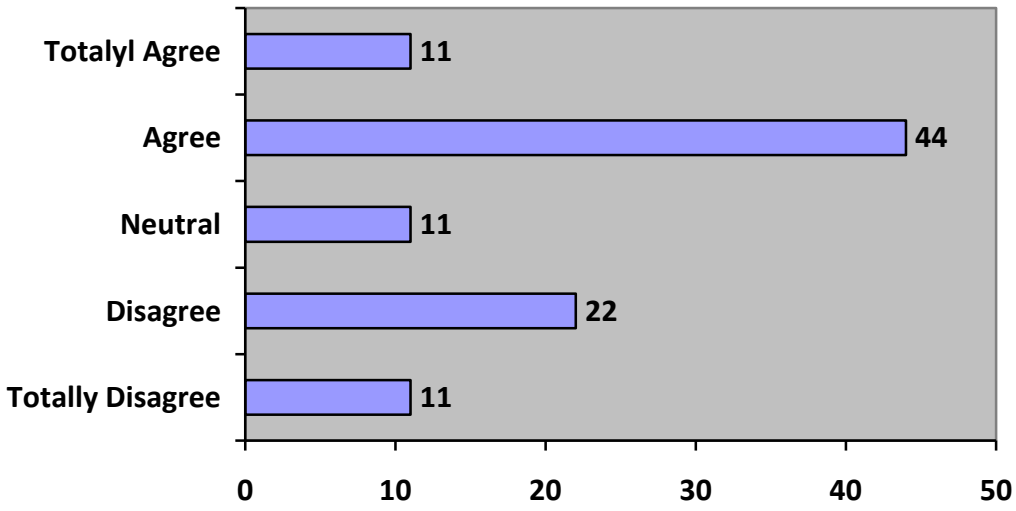


Chart 33 below indicates the College Management subgroup and the results are slightly different. Of the respondents 43% totally agreed and 42% agreed. Thus, 85% of respondents reacted positively. Also, 4% disagreed and 4% totally disagreed. Thus, 8% of the respondents reacted negatively and 8% were neutral.

Chart 33: Driver training will improve response times (College Management)



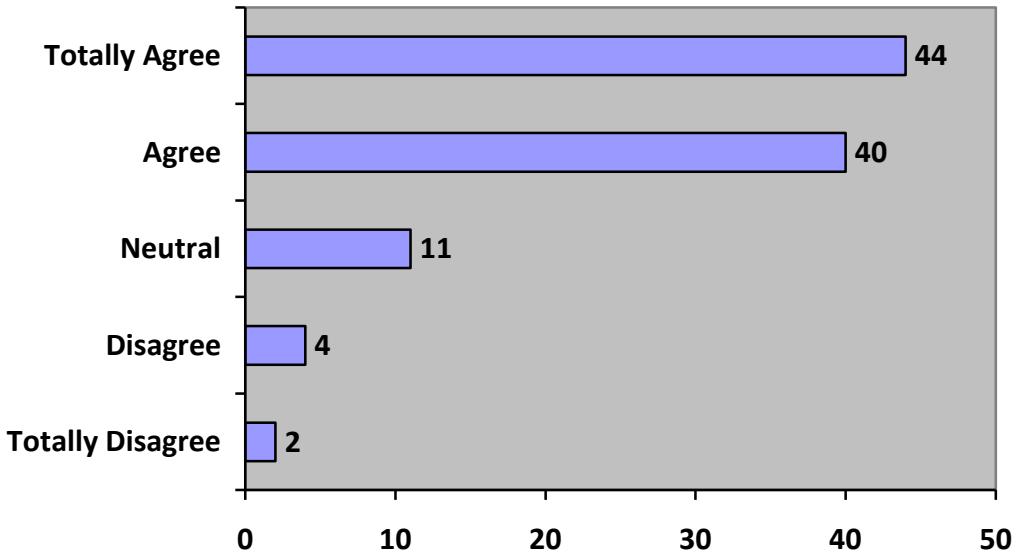
Notwithstanding the positive responses by staff that driver training will improve response times, in practice there seems to be no correlation between driver training and the improvement in response times. This is borne out by the marked increase in training but the seemingly constant poor response times reported. This means that even though there is training, the emergency vehicle is still taking as long or in certain instances even longer to get to the patient. It seems that though driver training is one of the factors that improve response times there are many other variables. Driver training has been conducted for many years in the North West Emergency Medical Services College but there has been no marked improvement in the response times.

4.3.1.6 Training will improve driving skills

The statement on driving skills was trying to establish whether the driver training that is provided actually made a difference to the staff's driving skills. Of the respondents 44% totally agreed and 40% agreed. Thus, 84% of respondents reacted positively. Also, 4% disagreed and 2% totally disagreed. Therefore 6% of the respondents reacted

negatively and 11% were neutral. This is shown in **Chart 34** below.

Chart 34: Training will improve driving skills



The accident rate of emergency vehicles in the province will have a bearing on whether this statement is true. Accident statistics for the North West Provincial Department of Health for the period from April 2010 to September 2010, obtained from the Transport Sub-directorate, are indicated in **Table 16**. The reason for using this source is that the Transport Sub-directorate is the custodian of all vehicles and they collate all accidents in relation to government vehicles.

Table 16: Emergency vehicle accidents from April 2010 to September 2010

Month	Number of Accidents
April 2010	13
May 2010	16
June 2010	2
July 2010	12
August 2010	5
September 2010	7
Total	55

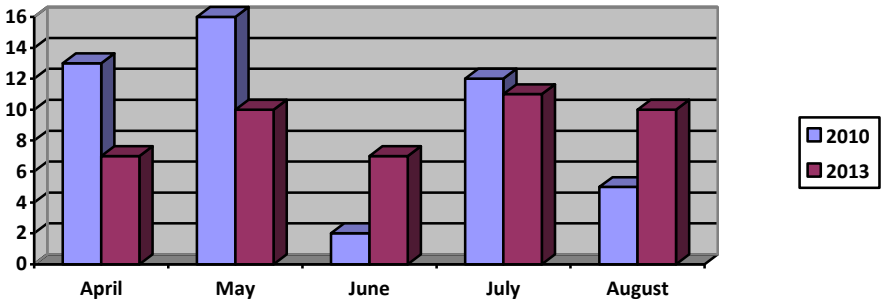
Table 16 above shows that in the whole fleet of the North West Provincial Department of Health there were 55 accidents in a six-month period. The present size of the fleet is 830 vehicles of which 126 are ambulances. It reflects an accident rate of 6.62% for the whole fleet in six months. This seems excessively high as it amounts to an average of nine accidents a month, which is a large number of accidents as all the drivers of government vehicles have to undergo driver training before they can drive a government vehicle. The training was introduced in 1994 when the North West Province was formed. Such a high accident rate warrants an evaluation of the value of this training.

Table 17 below shows the number of accidents that occurred in a similar period in 2013. The comparison between the two years is done in a graph in **Chart 35**. The number of accidents has shown a slight decrease from 9.2 to 7.5 per month.

Table 17: Vehicle accidents from April 2013 to August 2013

Month	Number of Accidents
April 2013	7
May 2013	10
June 2013	7
July 2013	11
August 2013	10
Total	45

Chart 35: Comparison of number of accidents



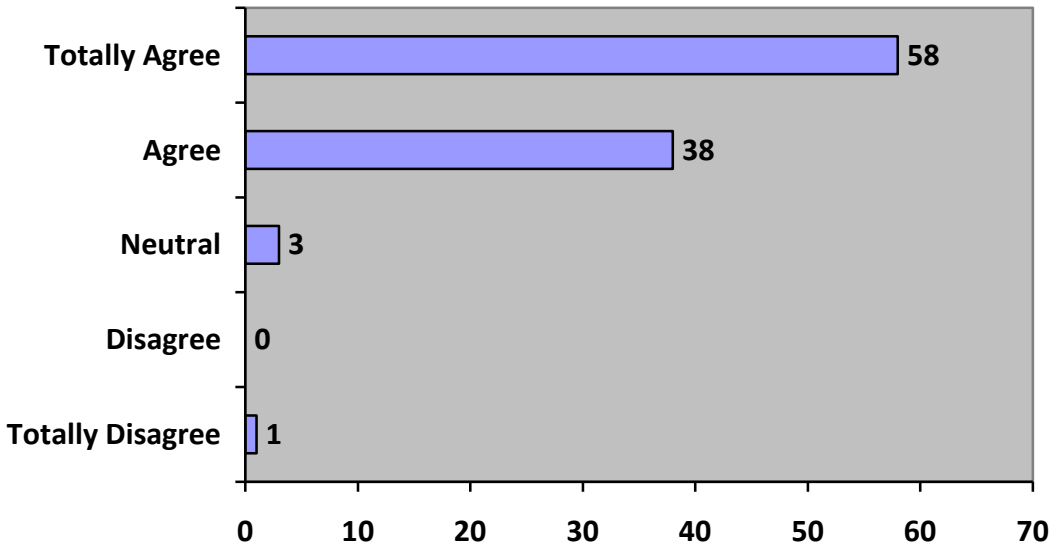
4.3.1.7 Training will improve the survival rate of patients

When the improvement in the survival rate of patients is looked at, it serves to establish whether the level of medical training of staff members positively affects the outcomes for patients. In effect, this would mean that an Emergency Medical Care Practitioner who received more advanced training will have better clinical skills and will be able to perform more advanced procedures when treating a patient. This in turn, means a reduction in morbidity and mortality. It is, however, important to note that the Emergency Medical Care Practitioner with the more advanced medical training will still have to arrive on time at the patient to begin treatment. Moreover, the same Emergency Medical Care Practitioner would have to ensure that his skill level is

constantly updated by means of Continual Medical Education.

Of the respondents 58% totally agreed and 38% agreed. Thus, 96% of respondents reacted positively. Also, none of the respondents disagreed and 1% totally disagreed. Thus, only 1% of the respondents reacted negatively and 3% were neutral. This is indicated in **Chart 36** below.

Chart 36: Training will improve the survival rate of patients



The above statement was supported by 100% of College Management, Emergency Medical Services Management and SMS members of Emergency Medical Services. This shows that the entire management cadre focus on both driver and medical training. The researcher expected all medically trained staff to express a positive opinion in this area.

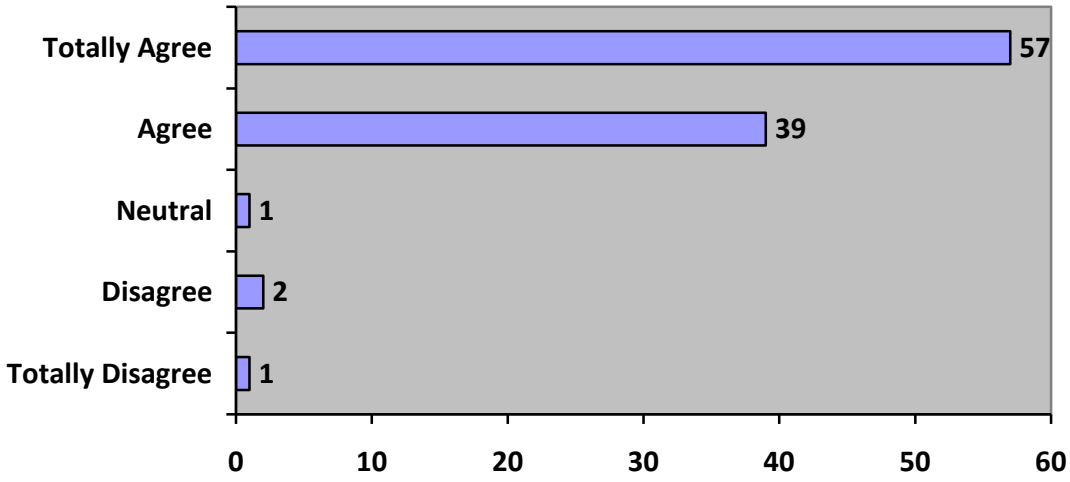
4.3.1.8 Training will improve the understanding of Emergency Medical Services

It is difficult to decide whether training, other than medical and driver training, will improve the understanding of the

Emergency Medical Services environment by the Emergency Care Practitioner. The statement may be subjective, but was aimed at finding out whether improvements in training will give the Emergency Medical Care Practitioner a better understanding of the environment they work in. The training thus given is not the medical or driver training course but courses that relate to other aspects of Emergency Medical Services, which are more support function related. It should be noted that the statement does not refer to the Emergency Medical Care Practitioners' improvement in training, but to provide the Emergency Medical Care Practitioners with a better understanding of the environment they find themselves in. An increasing percentage of the job function of the Emergency Medical Care Practitioner is administration. The Emergency Medical Care Practitioner should thus be skilled in these aspects as well in order to perform this function correctly. A good administrative basis will also assist with performance management and the gathering of data.

Of the respondents 57% totally agreed and 39% agreed. Thus, 96% of respondents reacted positively. Also, 2% disagreed and 1% totally disagreed. Therefore 3% of the respondents reacted negatively and only 1% was neutral. This is indicated in **Chart 37** below.

Chart 37: Administrative training will improve the understanding of the Emergency Medical Services environment



In essence, this would mean that some of the focus in Emergency Medical Services training will have to move away from the medical curriculum and focus on giving staff a better understanding of the Emergency Medical Services as a whole. With the current emphasis on record keeping to improve patient care and performance, it is essential that Emergency Medical Services staff members are also able to comply with this requirement. It would require an induction type course and other programmes to assist the staff member to understand their working environment and what is expected of them.

It should not be assumed that if an Emergency Medical Care Practitioner has the necessary medical and driver training that they have the necessary administrative skills. In the curriculum that relates to medical and driver training, there is not sufficient focus on the administrative modules. Besides, the fact that an Emergency Medical Care Practitioner has many years of experience does not necessarily mean that they have administrative knowledge. This results in problems in the area of clinical governance

and could also lead to medico-legal problems. The latest tertiary-based course has a greater focus on the administrative components.

4.3.1.9 Training comments

With regard to Emergency Medical Care Practitioners who are applying for training, most managers in Emergency Medical Services, as well as at the Training College, feel that the staff members in Emergency Medical Services do not see the service as a career. Thus people who cannot find any other form of employment end up in Emergency Medical Services, due to the present unemployment rate in the country as a whole. The present economic climate makes people look for jobs in areas where they previously would not have had an interest. This is also evident by the relatively young age of staff members employed. It is important to have a good age mix within the service as the older cadre impart knowledge to the younger members. In the past most of the employees in Emergency Medical Services were passionate about the profession.

The throughput rate for the students at the college backs up the above argument. In the fourth and sixth group of students on the Emergency Medical Technician programme were school leavers who went through a rigorous selection programme and the throughput rates were 45.83% and 70.83% (Emergency Medical Services Training College, 2012), respectively. In the fourth group three people left the course and did not return whilst one resigned. In the sixth group one resigned and one was dismissed. The fourth and sixth group received a salary whilst they were studying. The Training College then terminated the payment of a salary for the next two sets of school leavers, groups nine and ten. The

changes resulted in the students not receiving a salary and not being placed on PERSAL. The whole course as well as their accommodation was paid for, and they only received a stipend. This also shortened the disciplinary procedure as the students were no longer looked at as permanent employees, thus discipline could be implemented more swiftly. The students were aware of the fact that they would not receive any remuneration during the duration of their training, as this was highlighted in the training contract that was entered into. The throughput rates for these two groups were 73.91% and 87.5%, respectively. The improvement in the throughput rate when the students were aware that they would not receive a salary shows that the second group of school leavers were more motivated to receive training. It is important to bring back a culture of caring within the Emergency Medical Services environment. This is in fact true for the whole health sector; and could be extrapolated to the whole public service. Thus the selection criteria for training staff members need to look at which potential students have a caring ethos.

4.3.2 Emergency Medical Care qualification

According to the Health Professions Council of South Africa's annual report (HPCSA (2012;11), as previously referred to, there are 51,818 qualified Basic Life Support, 7,539 qualified Intermediate Life Support, 397 Emergency Care Technicians and 1,657 qualified Advanced Life Support Practitioners on the register in South Africa. According to these figures there is an oversupply of Basic Life Support qualified staff and an undersupply at all levels above that. The oversupply of the Basic Life Support trained staff results in the level of care provided to the patient being basic. If there were more Advanced Life Support qualified staff then the patients would be treated at an advanced level. From a

medical perspective, the ideal is that all patients are given the highest level of care possible. There are 84.4% qualified Basic Life Support staff registered with the Health Professions Council of South Africa. Information on the National Emergency Medical Services resources list obtained from the National Department of Health (13 September 2012) is given in **Table 18**.

Table 18: Staffing per Province

Province	Number of Basic Life Support qualified staff	Total Emergency Medical Services staff	Percentage of Basic Life Support staff
Free State	1,329	1,613	82.4
Gauteng	1,019	1,221	83.5
Mpumalanga	1,594	1,723	92.5
North West	712	941	75.7
Northern Cape	415	542	76.6

From the above information it is clear that in all the provinces the representation of Basic Life Support staff per ambulance is much higher than the 50% norm set by the National Department of Health. This is in keeping with information of the Health Professions Council of South Africa that shows a much higher percentage of Basic Life Support staff registered. The provinces need to develop a training plan to increase the other levels of staff so that the level of service increases from a basic service to a more advanced one.

In fact, it would be advisable to have at least one Emergency Medical Technician per ambulance. This would improve

patient care whilst in transit in an ambulance. Due to the lack of Emergency Medical Technicians, the second best option is to have an Emergency Medical Care Practitioner qualified at Intermediate Life Support level treating patients in the ambulance. According to a business plan developed for the North West Province by AFRICON (2010:28), the minimum staffing requirement per ambulance is one Basic Life Support and one Intermediate Life Support staff member. This is not the optimal situation as at least one staff member should be at the level of Advanced Life Support, though in the present setting it is not practical. At present, most ambulances in the North West Province have two Emergency Medical Care Practitioners trained at Basic Life Support level as crew members. The situation in the private Emergency Medical Services is different. In the larger companies, which are predominantly urban-based, most ambulances are manned by two Emergency Medical Care Practitioners, one who is at Basic Life Support level and one at Intermediate Life Support level. In the smaller companies, which are mostly rural, the situation is the same as in the public sector where most ambulances have two Emergency Medical Care Practitioners who are at Basic Life Support level. The reason for the private sector being better resourced in the urban areas is that they can offer their employees more competitive salaries. The private sector also does not have to have a high training bill as most of their skilled staff is poached from the public sector since the private sector's remuneration is higher.

Respondents were requested to consider and respond to the following statements in the questionnaire:

- Staff members with Basic Life Support qualifications are sufficient for patient care;

- Staff members with Intermediate Life Support qualifications are sufficient for patient care; and
- Staff members with Emergency Care Technician qualifications are sufficient for patient care.

The questionnaire addressed three levels of Emergency Medical Care training and these statements were specifically made to determine whether Emergency Medical Services staff was aware what staff qualification levels are required to provide optimum patient care. The Advanced Life Support level was not assessed as the North West Province does not have any such practitioners working at an operational level.

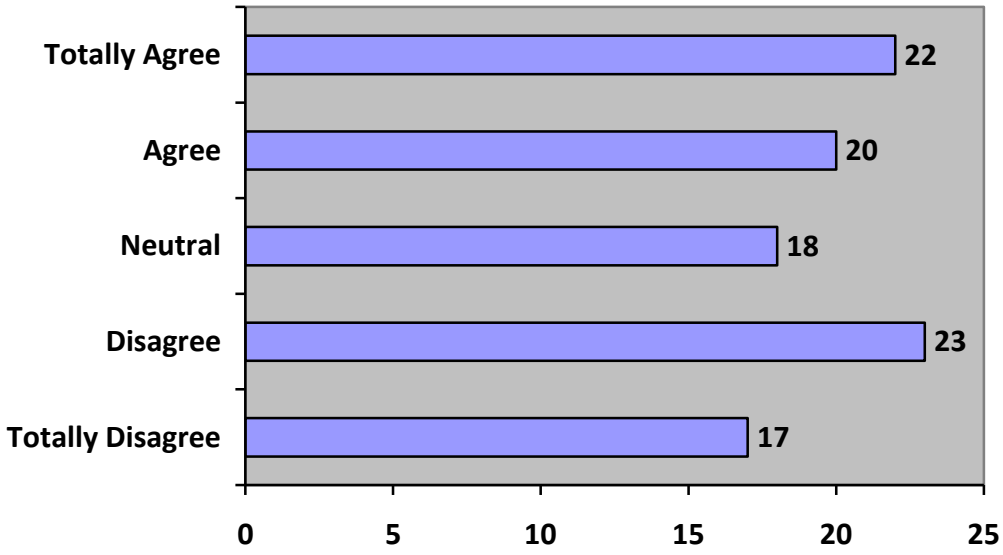
4.3.2.1 Staff members with Basic Life Support qualifications are sufficient for patient care

Firstly, the Basic Life Support qualification was looked at. The statement made was to see whether respondents felt that Emergency Medical Care Practitioners with the basic qualification are sufficient for patient needs. The qualification only allows the practitioner to provide very basic treatment to the patient. A skills set per level of qualification it attached as Annexure A. A large percentage of the respondents have this qualification. From a management point of view it would be better if this situation were avoided as it is not optimal in terms of improved patient care.

Of the respondents 22% totally agreed and 20% agreed. Thus, 42% of respondents reacted positively. Also, 23% disagreed and 17% totally disagreed. Therefore, 40% of the respondents reacted negatively and 18% were neutral. In essence, this means that there is a lack of understanding of what is required to provide effective patient care. It is a

logical assumption that the more advanced the level of training of the Emergency Medical Care Practitioner, the better the level of care received by the patient. Thus Emergency Medical Care Practitioners with lower levels of training see themselves as patient transports and therefore do not provide adequate care. As previously mentioned, a majority of the respondents have the Basic Life Support qualification and therefore they may not see the need for any higher qualification. This is shown in **Chart 38** below.

Chart 38: Basic Life Support qualifications are sufficient for patient care



If the subgroups are looked at, the following is found. Of the Senior Management Services 50% disagree and 50% totally disagree. Thus 100% is negative. This is shown in **Chart 39** below. In the College Management subgroup 33% disagree and 44% totally disagree. Thus 77% are negative. This is shown in **Chart 40** below. In the Emergency Medical Services management subgroup 43% disagree and 14% totally disagree. Thus 57% is negative. This is shown in **Chart 41** below. It is not surprising to see that as one move down the management scale the percentage drops. This may mean

that the understanding of who should form part of the crew of an ambulance is not the same. Emphasis should be put on ensuring that managers at all levels are in agreement with what type of crew should be in an ambulance. This can be achieved by deciding on the correct staff mix for an ambulance. The current staff mix should then be looked at to determine how the current staff can migrate to the ideal model.

Chart 39: Basic Life Support qualifications are sufficient for patient care (SMS)

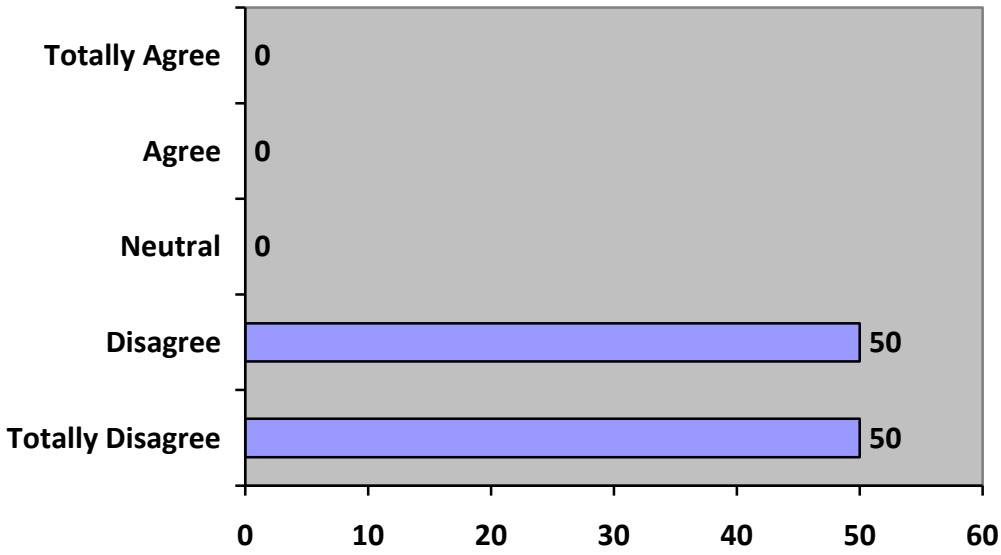


Chart 40: Basic Life Support qualifications are sufficient for patient care (College Management)

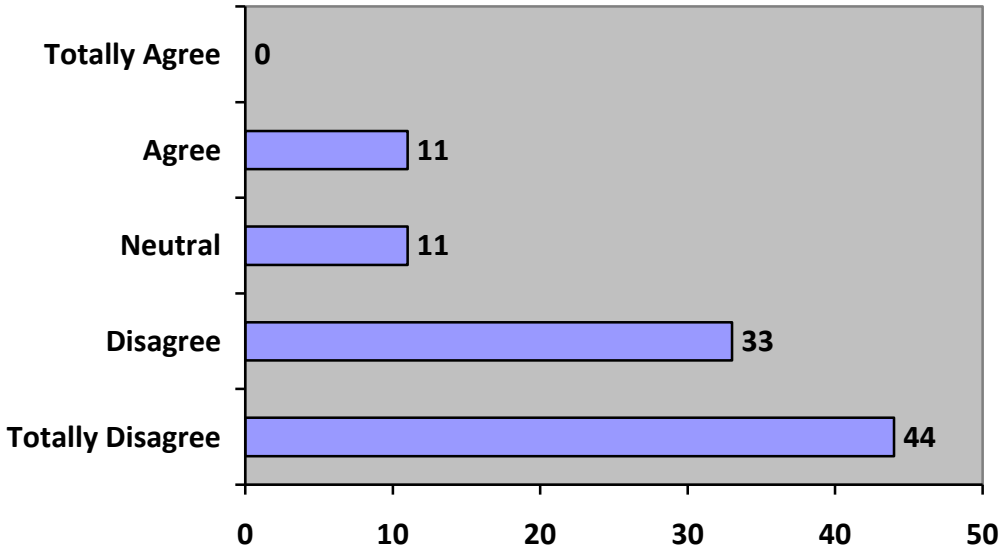
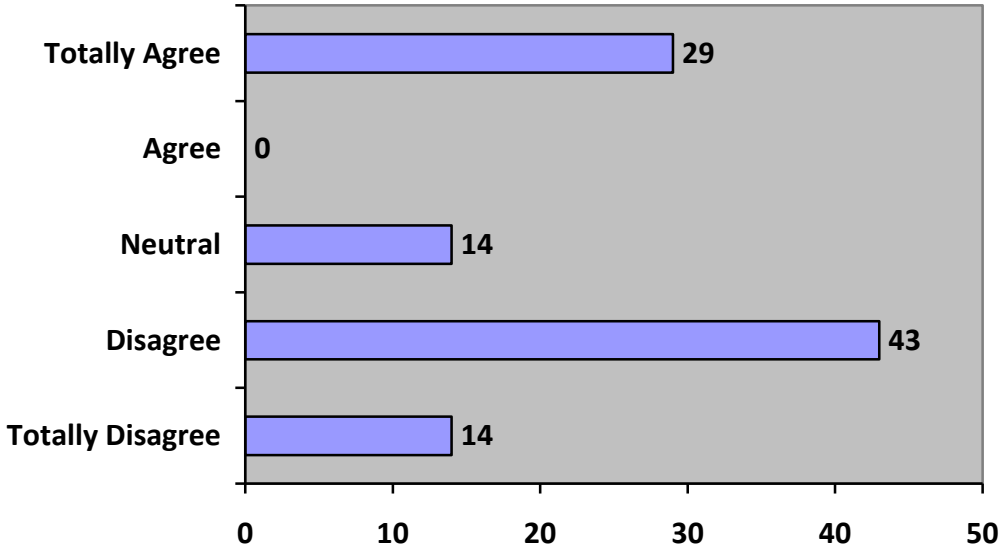


Chart 41: Basic Life Support qualifications are sufficient for patient care (EMS Management)

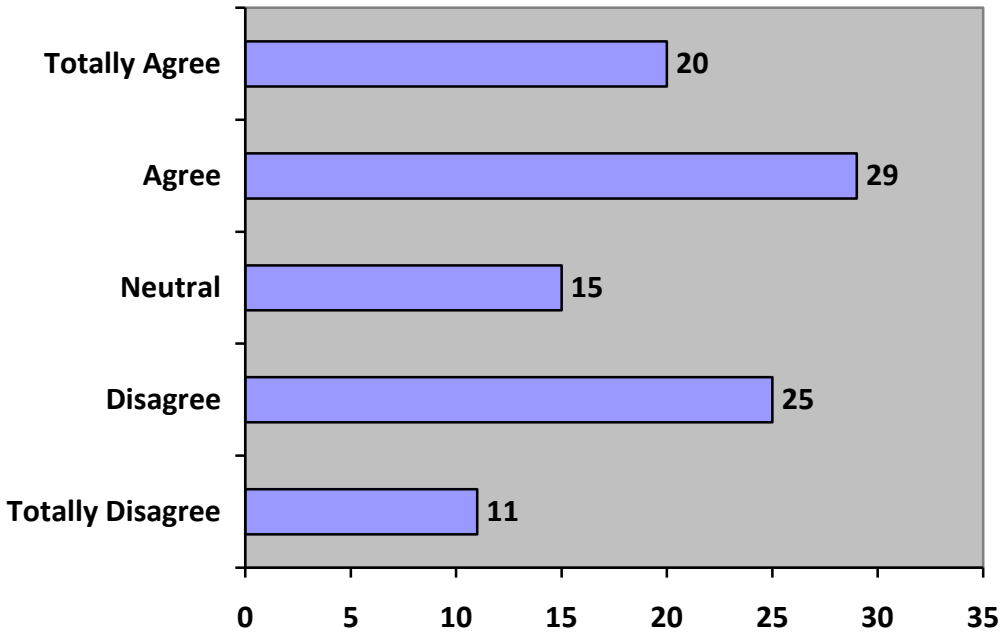


4.3.2.2 Staff members with Intermediate Life Support qualifications are sufficient for patient care

Secondly, the Intermediate Life Support qualification was looked at. The statement was made to see whether respondents felt that Emergency Medical Care Practitioners with the intermediate qualification were sufficient for patient needs. The qualification allows for the practitioner to provide the basic medical care as well as administering a limited number of drugs. A skills set per level of qualification is attached as Annexure A.

Of the respondents 20% totally agreed and 29% agreed. Thus, 49% of respondents reacted positively. Also, 25% disagreed and 11% totally disagreed. Thus 6% of the respondents reacted negatively, while 15% of the respondents were neutral. This is shown in **Chart 42** below.

Chart 42: Staff members with Intermediate Life Support qualifications are sufficient for patient care



The increase in the number of staff being positive is due to the fact that most Emergency Medical Care Practitioners who

are qualified at a basic level aspire to be qualified at an intermediate level. Also, a large percentage of staff does not have the capacity to complete the tertiary qualification. This assumption is based on the fact that there is a higher failure rate of staff attempting the entrance examination for the tertiary qualification. Thus, the intermediate qualification is a ceiling for the majority of staff members.

If the subgroups are looked at, the following is found. Of the Senior Management Services 50% disagree. Thus, 50% are negative. This is shown in **Chart 43** below. In the College Management subgroup 56% disagree. Thus 56% are negative. This is shown in **Chart 43** below. In the Emergency Medical Services Management subgroup 29% disagree and 29% totally disagree. Thus 58% are negative. This is shown in **Chart 44** below. This is interesting because the intermediate qualification has been the mainstay on ambulances over the past few years. Also, most Emergency Medical Services managers have the intermediate qualification. The move to the mid-level worker qualification (Emergency Medical Technician) is a fundamental shift in the thinking of the Emergency Medical Care Practitioner. This also occurred twenty years ago when the National Diploma in Ambulance and Emergency Care was first offered. The shift to tertiary qualification is essential and a mind-set change has to occur within the service.

Once again, if the subgroups are considered, the following is found. Senior Management Services are 50% neutral. This is shown in **Chart 43** below. In the College Management subgroup 22% are neutral. This is shown in **Chart 43** below. In the Emergency Medical Services Management subgroup no respondents are neutral. This is shown in **Chart 44** below. The research would expect the management cadre to be

more decisive and have an opinion, either negative or positive, on the issue. The issue would have to be looked at to see whether the managers are correctly placed and whether they have a good understanding of the environment they work in.

Chart 43: Staff members with Intermediate Life Support qualifications are sufficient for patient care (SMS)

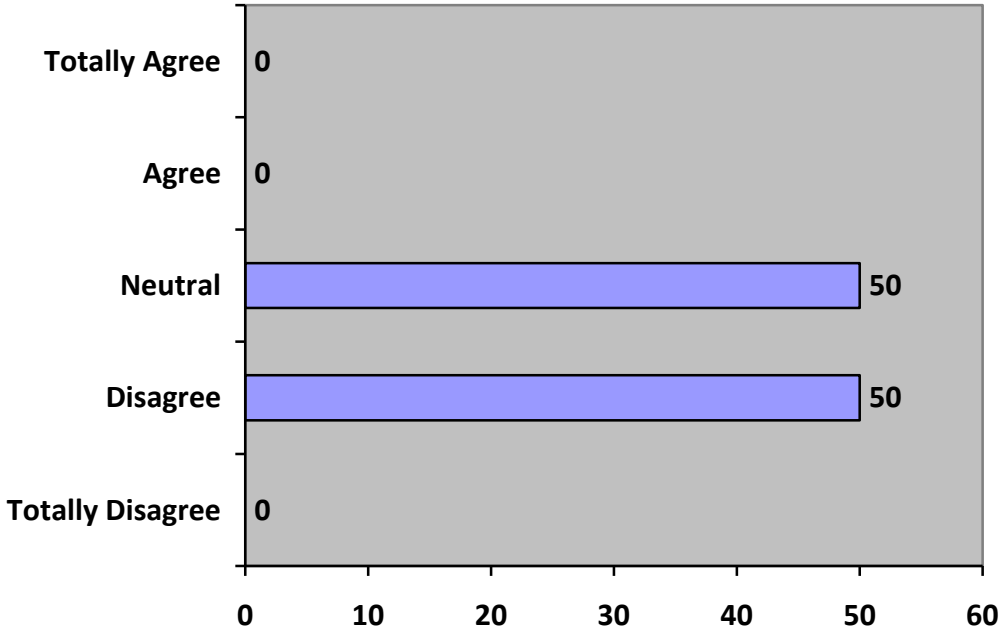


Chart 44: Staff members with Intermediate Life Support qualifications are sufficient for patient care (College Management)

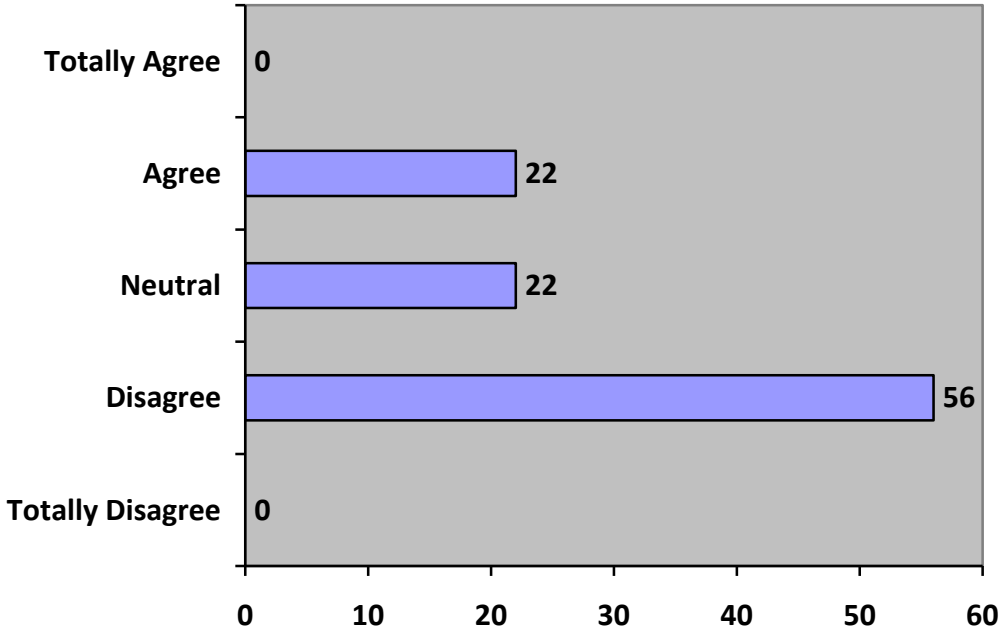
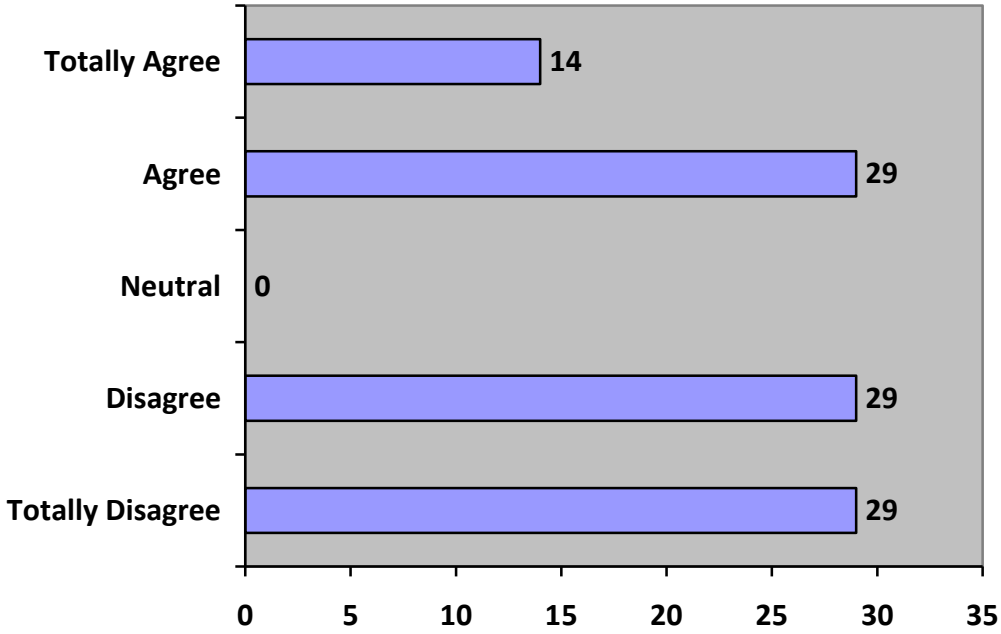


Chart 45: Staff members with Intermediate Life Support qualifications are sufficient for patient care (EMS management)

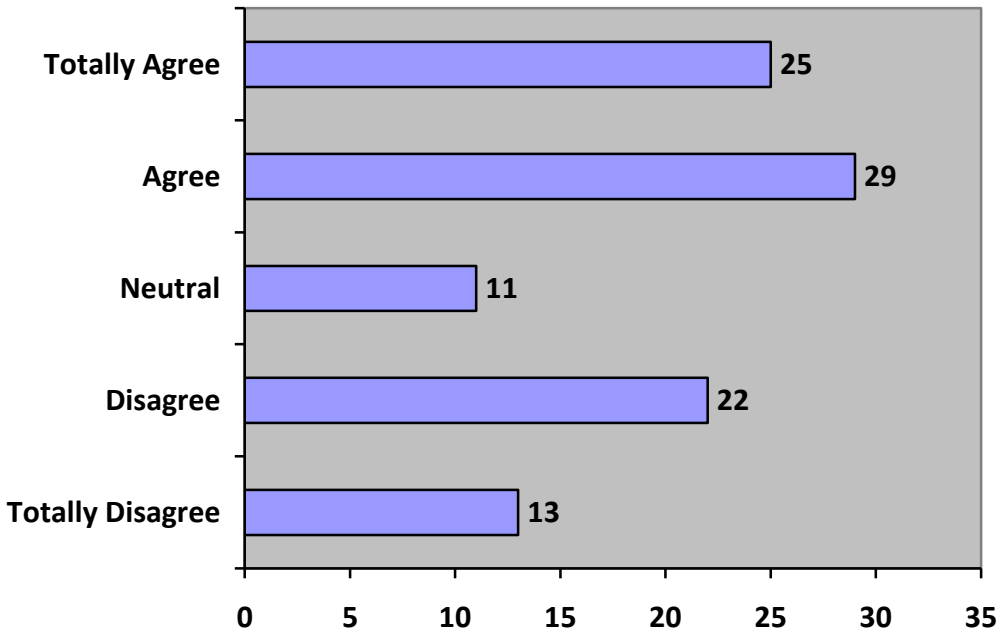


4.3.2.3 Staff members with Emergency Care Technician qualifications are sufficient for patient care

Finally, the Emergency Medical Care Technician qualification was looked at. The statement was made to see whether respondents felt that the Emergency Medical Technician qualification was sufficient for patient needs. The qualification is the entry level to advanced life support. This is also the entry level for a tertiary qualification by Emergency Medical Care Practitioners.

Of the respondents 25% totally agreed and 29% agreed. Thus, 84% of respondents reacted positively. Also, 22% disagreed and 13% totally disagreed. Therefore 6% of the respondents reacted negatively and 11% were neutral as shown in **Chart 46** below. This also indicates that there is a lack of understanding of what is required to provide effective patient care as there is still too much emphasis on non-tertiary qualifications.

Chart 46: Staff members with Emergency Medical Technician qualifications are sufficient for patient care



If the subgroups are looked at, the following is found. Senior Management Services agree by 100%. Thus 100% are positive as shown in **Chart 47** below. In the College Management subgroup 33% agree and 11% totally agree. Thus 44% are positive as shown in **Chart 48** below. In the Emergency Medical Services management subgroup 29% agree and 14% totally agree. Thus 43% are positive. This is shown in **Chart 49** below. The fact that senior managers are positive is evidence that Emergency Medical Services training is progressing. The fact that such a low percentage is given by College Management could be an indication that as trainers, they may require staff with even higher levels of skill. At this point, however, this is impractical. The Emergency Medical Services management, as previously stated, has mostly intermediate qualification. A mind-set change still needs to be made in this subgroup.

Chart 47: Staff members with Emergency Medical Technician qualifications are sufficient for patient care (SMS)

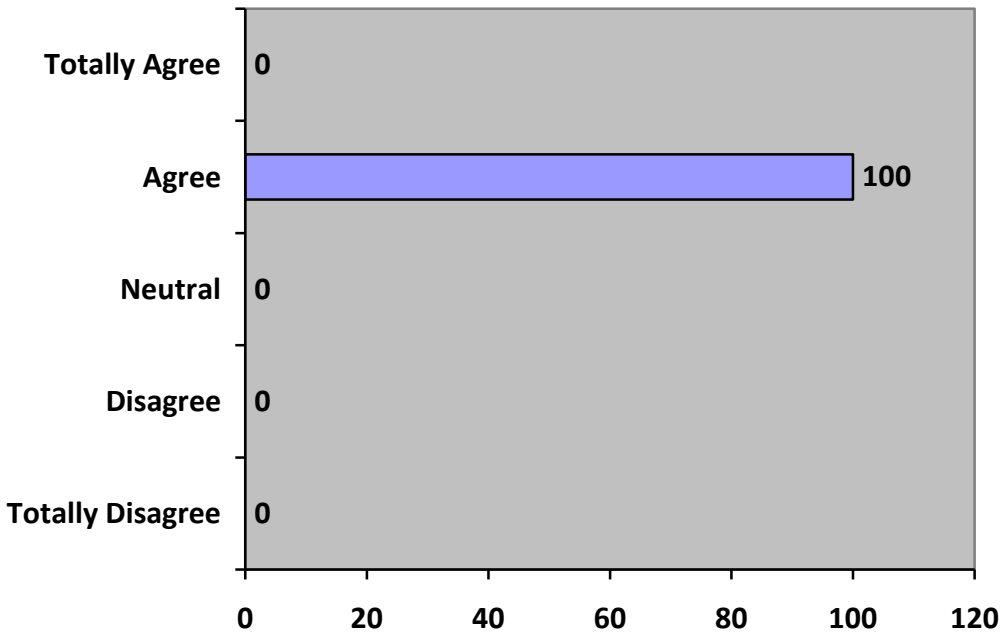


Chart 48: Staff members with Emergency Medical Technician qualifications are sufficient for patient care (College Management)

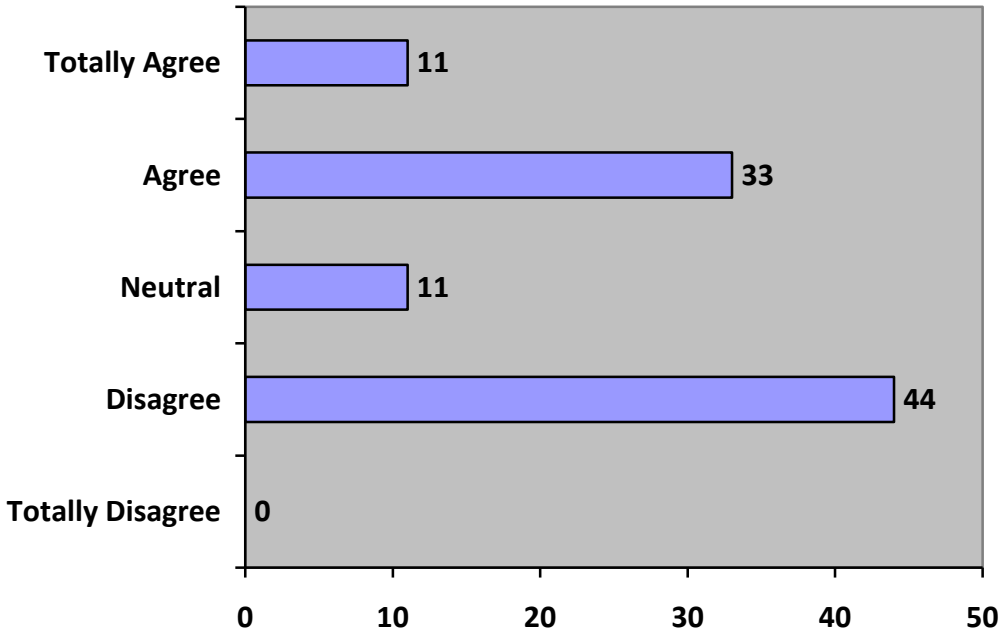
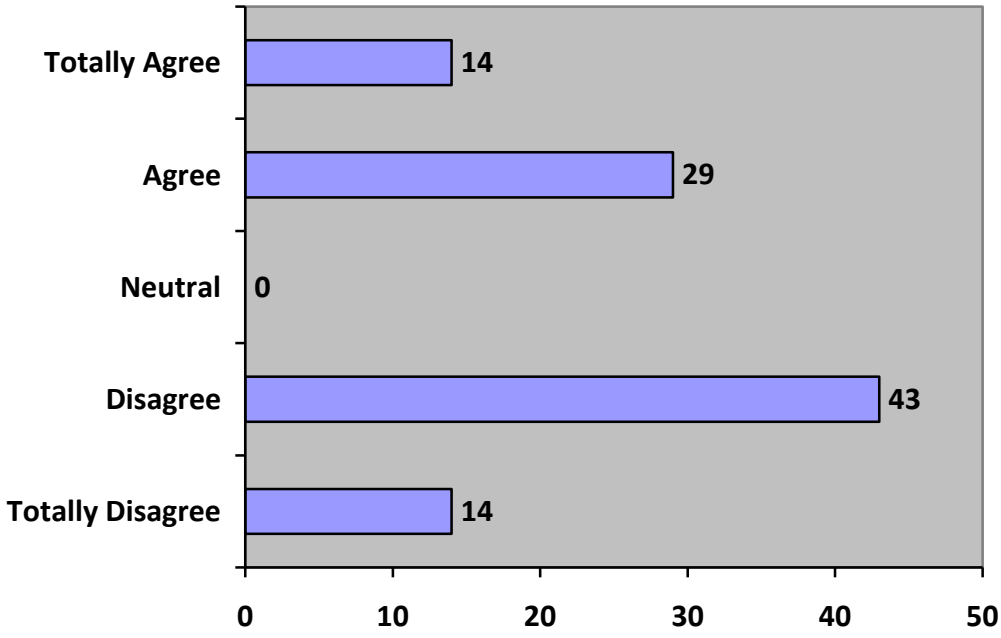


Chart 49: Staff members with Emergency Medical Technician qualifications are sufficient for patient care (EMS management)



4.3.2.4 Qualification comments

The large number of neutral responses across all the questions is also surprising.

- For Basic Ambulance Assistant it is 18%;
- For Intermediate Ambulance Assistant it is 15%; and
- For Emergency Care Technician it is 11%.

The Emergency Medical Care Practitioners who responded are all qualified at different levels within the Emergency Medical Services and should have an opinion on the level of staff required.

It should be noted that three statements are dealt with regarding the qualification level of staff members. The qualification levels of staff looked at is Basic Life Support, Intermediate Life Support and Emergency Medical Technician.

The levels higher than the above are not offered in the Province and thus do not form part of the analysis. These would be the Critical Care Assistant, National Diploma and the Baccalaureus Technologiae degree which are offered by universities of technology. It is important to note the responses in this context to see whether there is an understanding of the statement made.

The current trend is towards the mid-level worker who has a tertiary qualification. This is a policy shift by National government but the implementation at Provincial government lags behind. Only three of the nine provinces have a fully operational Emergency Care Technician programme, and two other provinces started the programme at the beginning of 2013.

4.3.3 Staffing level of ambulances

It should be noted that the following deals with the qualifications of ambulance staff. The following statements made in the questionnaire required the respondents to consider and respond to:

- An ambulance should have a crew of at least two staff members, qualification is not relevant;
- An ambulance should have a crew of at least two Basic Life Support qualified staff members;
- An ambulance should have a crew of which at least one is an Intermediate Life Support qualified staff member; and
- An ambulance should have a crew of which at least one is an Emergency Medical Technician qualified staff member.

It is the researcher's view that an ambulance with a single crew member cannot cater for a patient's needs. An ambulance requires a minimum of two persons. If there is only one person in an ambulance, the level of qualification is irrelevant, as it is impossible to both drive an ambulance and treat the patient at the same time. When one staff member is driving, another staff member should provide care to the patient, preferably the highest qualified staff member should provide the patient care in transit. Thus, whilst in transit, the patient would in theory receive the best possible care that particular ambulance has to offer.

It is impossible to provide adequate patient care whilst at the same time driving a vehicle. This is sometimes only acceptable in a mass casualty situation where there are many slightly injured patients that only require a check-up at

the hospital. That implies that they are stable enough not to require medical care en route to the hospital. This should, however, not be the norm but the exception. It is well-known that the condition of an apparently stable patient could deteriorate during transportation to the hospital.

Each ambulance is required to have two staff members, one to drive and the other to treat the patient. Treatment of the patient should not be stopped until the patient is handed over to the next Health Care Professional, who will then take over to provide more specialised treatment. The Health Care Professional could be at any level of care within the health care system.

Although this is the case in the North West Province, it is not the same in all provinces in the country. The Northern Cape, for instance, still operates a system where they use a single-person ambulance crew. This is due to low population density and a relatively small budget.

The levels of staff looked at are staff with a Basic Life Support, Intermediate Life Support or Emergency Care Technician qualification. It is important to note the responses of each staff member to the individual statements, then look at them in conjunction to see whether there is an understanding of the question posed. The issue of the staff member's qualification has been discussed in the previous section.

4.3.3.1 An ambulance should have a crew of at least two staff members, qualification is not relevant

Firstly, the focus was on an ambulance that is not manned by qualified staff. The statement posed was that it is felt that

one person is not sufficient to man an ambulance. It also serves to check whether respondents felt that a qualification was necessary.

Of the respondents 5% totally agreed and 18% agreed. Thus, 23% of respondents reacted positively. Also, 22% disagreed and 46% totally disagreed. Therefore, 68% of the respondents reacted negatively and 8% were neutral, which is indicated in **Chart 50** below. The fact that only 68% are negative is of concern. All Emergency Medical Services trained staff are expected to have a negative sentiment. The training of Emergency Medical Care Practitioners emphasizes that once treatment is started on the patient it cannot be stopped. Treatment may only be terminated if a patient is deceased or has been handed over to another Health Care Professional. This would mean that a minimum of two staff members should be present. This is evident from the responses of College Management and Senior Management, both of whom disagree 100% with the statement. It is of great concern that only 71% of Emergency Medical Services management (**Chart 51**) disagree with the statement. Once again this may show that there may be a lack of understanding of the correct number of ambulance staff required by the Emergency Medical Services management.

Chart 50: An ambulance should have a crew of at least two staff members, qualification is not relevant

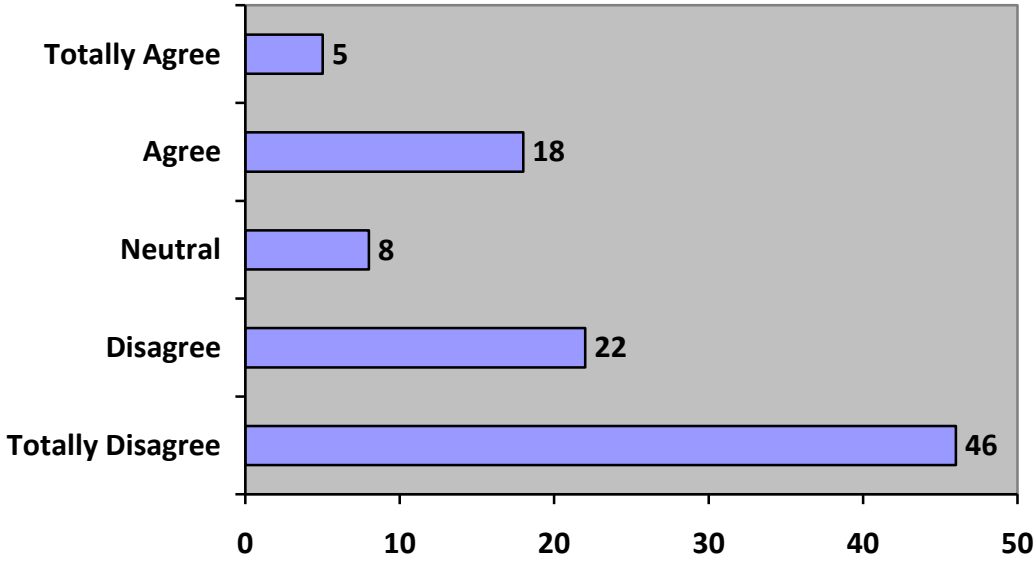
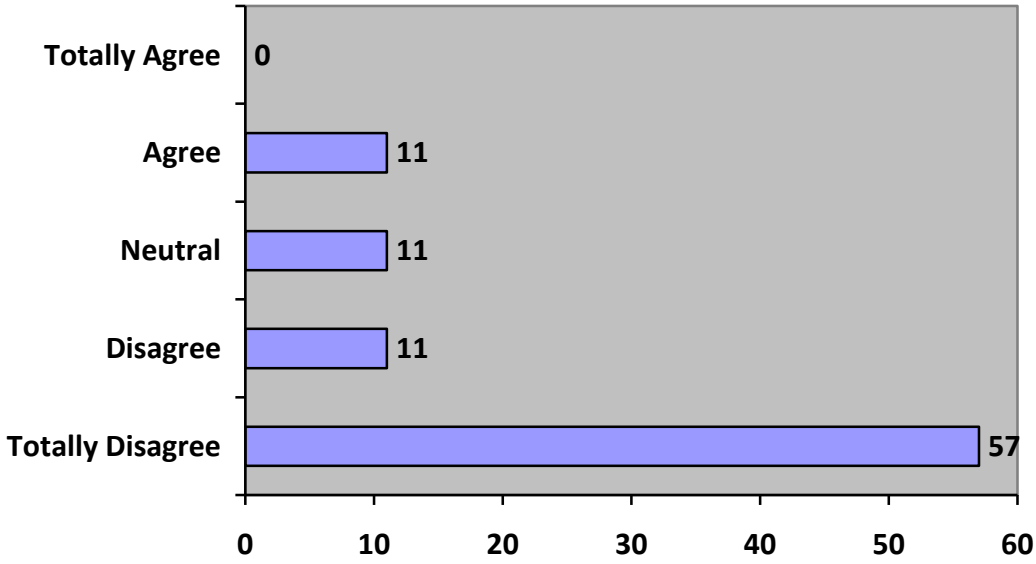


Chart 51: An ambulance should have a crew of at least two staff members, qualification is not relevant (EMS managers)



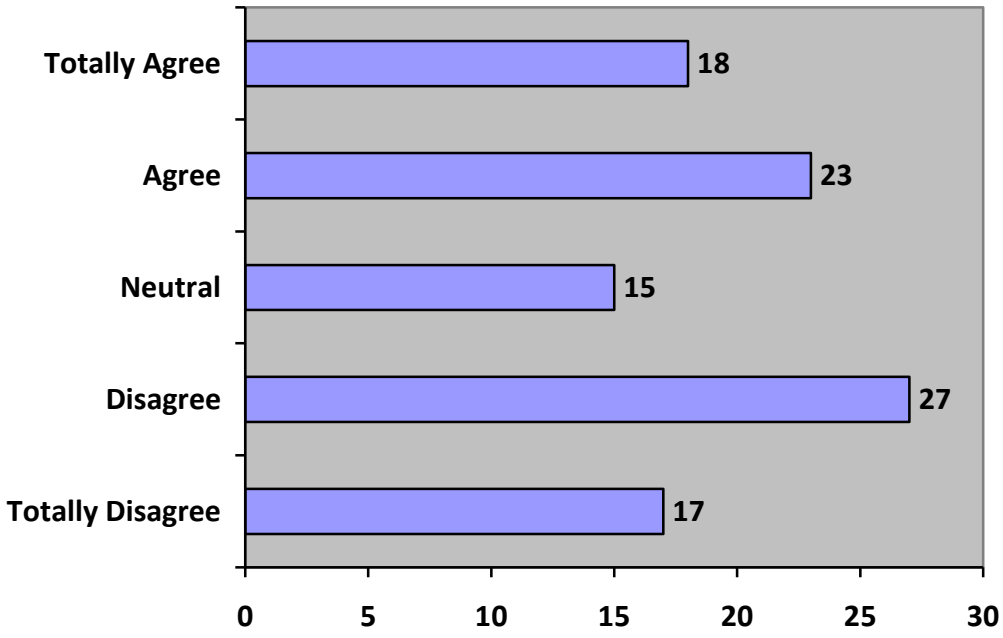
4.3.3.2 An ambulance should have a crew of at least two Basic Life Support qualified staff members

Secondly, Basic Life Support qualified staff were looked at. The statement aims to establish whether the respondent is of the opinion that the basic qualification is sufficient to

provide patient care. This would be the basic minimum to provide any sort of patient care. With regard to the results it should be noted, as previously stated, that the majority of the respondents possess this qualification.

Of the respondents 18% totally agreed and 23% agreed. Thus, 84% of respondents reacted positively. Also, 27% disagreed and 17% totally disagreed. Therefore, 44% of the respondents reacted negatively with 15% being neutral. This is indicated in **Chart 52** below.

Chart 52: An ambulance should have a crew of at least two Basic Life Support qualified staff members

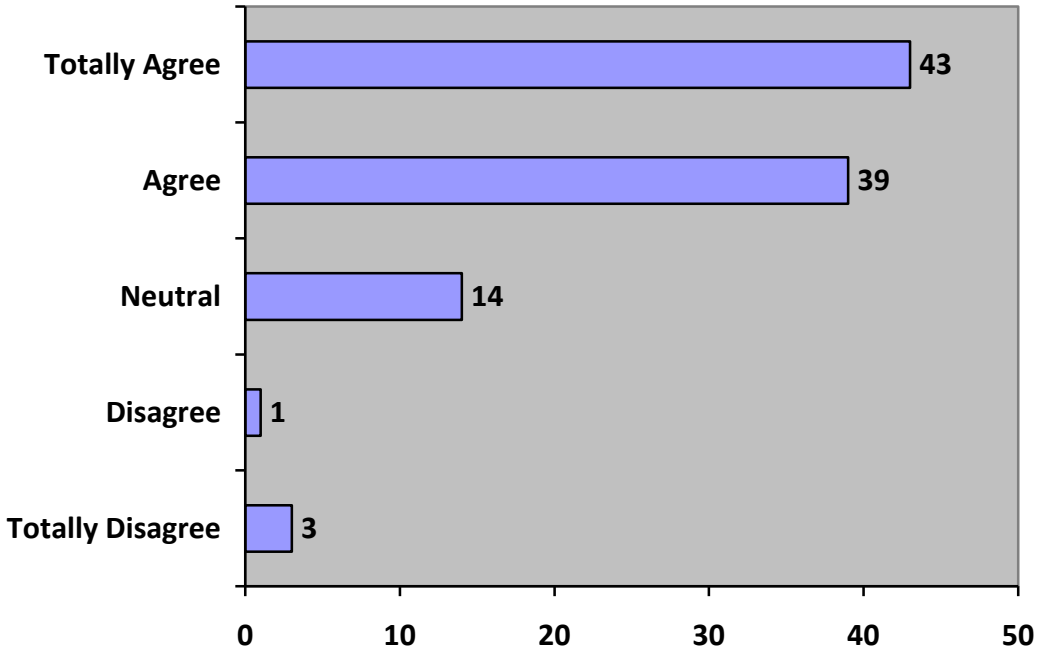


4.3.3.3 An ambulance should have a crew of which at least one is an Intermediate Life Support qualified staff member

Thirdly, Intermediate Life Support qualified staff were looked at. The statement aims to find out whether the respondent is of the opinion that the Intermediate Life Support qualification is sufficient to provide patient care.

Of the respondents 43% totally agreed and 39% agreed. Thus, 82% of respondents reacted positively. Also, 1% disagreed and 3% totally disagreed. Therefore 4% of the respondents reacted negatively and 14% were neutral. This is indicated in **Chart 53** below.

Chart 53: An ambulance should have a crew of which at least one is an Intermediate Life Support qualified staff member.



This is an overwhelmingly positive response and in Emergency Medical Services it is the level of service most staff would like to see. It is a clear indication of most staff's understanding and of the level at which they think the service should be delivered.

However, this statement is similar to the one in the previous section in relation to qualifications and the respondents were only 49% positive on that issue. In the response to this statement all of the respondents are 82% positive. That could mean that the understanding of qualification in relation

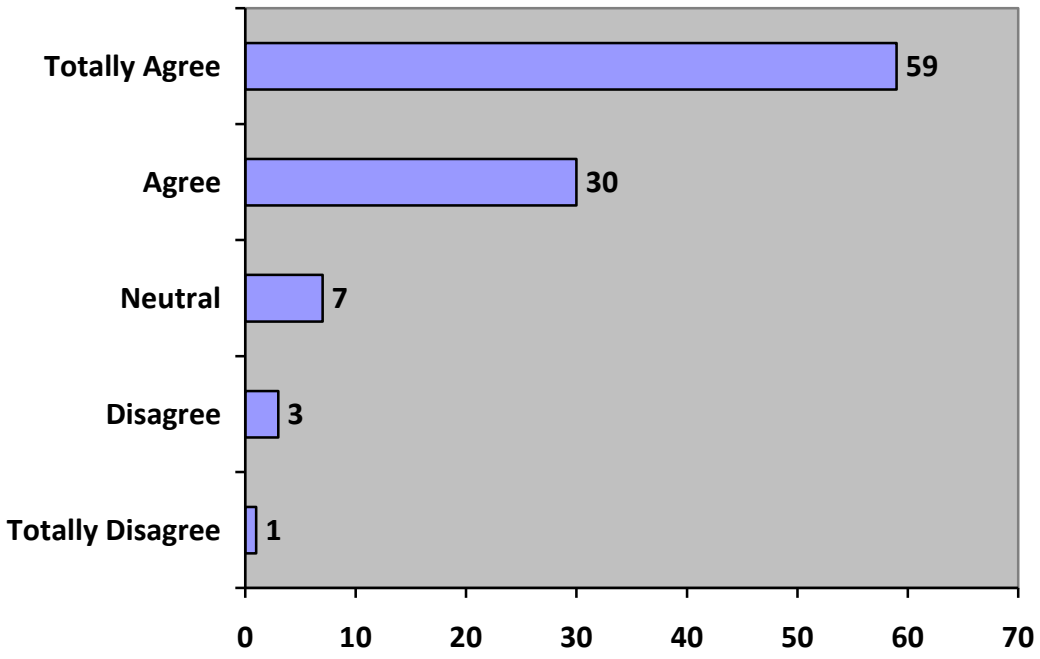
to service delivery was not clear. That would imply that the respondents do not know that the higher the level of qualification the better the service that will be delivered. It may seem to be a logical conclusion, but it is not borne out by the responses received.

4.3.3.4 An ambulance should have a crew of which at least one is an Emergency Medical Technician qualified staff member

Finally, the opinions of respondents were looked at in relation to Emergency Medical Technician qualified staff. The statement aims to find out whether the respondent is of the opinion that the entry level tertiary qualification is sufficient to provide patient care.

Of the respondents 59% totally agreed and 30% agreed. Thus, 89% of respondents reacted positively. Also, 3% disagreed and 1% totally disagreed. Therefore 4% of the respondents reacted negatively and 7% were neutral, as indicated in **Chart 54** below.

Chart 54: An ambulance should have a crew of which at least one is an Emergency Medical Technician qualified staff member



In essence, this is the level of qualification required by staff members to deliver optimal patient care. The percentage of respondents that totally agree is 59%, which are an improvement on the 43% for the intermediate qualification and a vast improvement on the 18% for the basic qualification. This response may indicate that the need for a tertiary qualification is starting to make inroads into the training system. The fact is that most of the staff who work in Emergency Medical Services would like to obtain a tertiary qualification. However, with the result in the areas based purely on training it may be too early to claim a victory.

But this statement is similar to the one in the previous section on qualification and the respondents were only 54% positive on that issue. In the response to this statement they are 89% positive. This could mean, as previously stated, that the understanding of qualification in relation to service

delivery was not clear. This would mean that the respondents do not seem to understand that the higher the level of qualification of the staff member on an ambulance, the more service delivery improves.

4.3.3.5 Staffing level comments

Once again there are a large number of neutral responses:

- For no qualification it is 8%;
- For Basic Ambulance Assistant it is 15%;
- For Intermediate Ambulance Assistant it is 14%; and
- For Emergency Care Technician it is 7%.

As previously stated, the Emergency Medical Care Practitioners who responded are staff with a medical qualification, and who should have an opinion on the level of staff that is necessary.

The disjunction between this set of statements and the previous set is a worrying factor. It seems as if there is a lack of understanding of the relevance of qualifications in relation to the staffing of an ambulance, as well as the impact that this has on service delivery. It is logical that if a staff member on an ambulance has a higher level of qualification then the treatment that is supplied to the patient would obviously be higher. If each patient gets an improved level of care then by inference the service delivery by Emergency Medical Services improves. It does not bode well for medically qualified staff working in a health care environment that they do not understand this.

4.3.4 Response times

The response time is measured from the time the Communication Centre receives the call until the ambulance arrives at the patient to start treatment. From the point of view of the public, it is the time from when they requested assistance until the time they receive it. It should be noted that in times of crisis the passage of time seems much longer than it actual is. Thus most persons who call for an ambulance are of the impression that it takes longer for the ambulance to get to them than it actually does. This is sometimes a point of contention.

The following statements in the questionnaire required the respondents to consider and respond to:

- Lack of ambulance availability results in an increase in response times;
- Lack of staff results in an increase in response times;
- Extensive travelling distances result in an increase in response times;
- Small and widespread rural populations result in an increase in response times;
- Factors beyond our control (factors that are not related to staffing, response times and training) result in an increase in response times; and
- Response times impact on patient care.

There are many possible areas of delay when a response time is calculated. Firstly, how quickly the call was made from the time the incident occurred. This would mean, did the caller first panic or try to do something else to assist before making the call? Also, the caller may not immediately have identified the patient's condition as an emergency. Most members of the public will not identify the signs that

indicate the onset of an emergency and may only make the call when it is already too late. The caller may also dial the incorrect number or dial a Fire Department instead of Emergency Medical Services. Delays also occur as many callers with cellular telephones phone the emergency number of their service provider and this call has to be rerouted to the Emergency Medical Services.

Secondly, the efficiency with which the operator in the Communication Centre collects and captures the details of the call. The time it takes for the operator to answer the telephone also has a time implication.

Thirdly, the delay from the receipt of the call in the Communication Centre until the ambulance crew is informed of the call. How busy the operators in the Communication Centre are makes a significant difference. They will delay calls that they see as non-priorities to make sure the emergencies are dealt with first.

Fourthly, the time of day has an impact. When staff members are busy changing shifts it results in delays. The shift that is going home may delay the call and wait for the shift coming on duty so that they do not end up going home late. At meal times a delay may also occur. The Emergency Medical Care Practitioner may be eating and prefer to complete his meal before responding to the case. At night, as well, when it is not busy there may be a delay as the Emergency Medical Care Practitioner may be asleep.

Fifthly, the time the ambulance crew takes to get into their vehicle after they were informed. The time of day also has an impact on this. When staff members are busy changing shifts it results in delays. When crew members are close to

knock-off time, there may be a delay as they wait for the new shift to arrive, so that they do not have to do the late call and arrive home late. At meal times delays may also occur, as staff members will want to finish their meal before responding to the call. When there are competent, committed and responsible crew members, then the changing of shifts, lunch times, and time to the vehicles, knock-off times, should not even be a consideration. For instance, the new shift should arrive in time to ensure that there is no delay in taking over. In my opinion, a lack of discipline is a major issue if these aspects are considered to be blamed for delays.

Sixthly, the road or traffic conditions that prevailed during the ambulance journey from its point of origin until it arrives at the patient. If the ambulance is travelling on an open road it will get to the patient faster as opposed to an ambulance travelling through traffic. An ambulance travelling on a macadamised surface will travel faster than an ambulance on a corrugated road. The driving skill of the Emergency Medical Care Practitioner also has an impact. The roadworthiness of the ambulance plays a part, as a newer vehicle can safely be driven faster as opposed to an older unmaintained vehicle.

Finally, the time it takes for the ambulance crew to move from the ambulance to the patient. The ambulance crew may have to wait for a guide. This is applicable if the patient is not at the address they have been given, but at a separate location. The area that they have entered may be unsafe and they will have to wait for a police escort. The terrain may be uneven and make walking to the patient difficult, as the patient may be a distance away from the vehicle. In the case of a city, the patient may be in a high-rise building. If this

building has a working lift or if the ambulance crew has to climb a few flights of stairs, makes a difference.

The different delays are not looked at individually, but the response time is looked at realistically as a whole.

4.3.4.1 Lack of ambulance availability results in an increase in response times

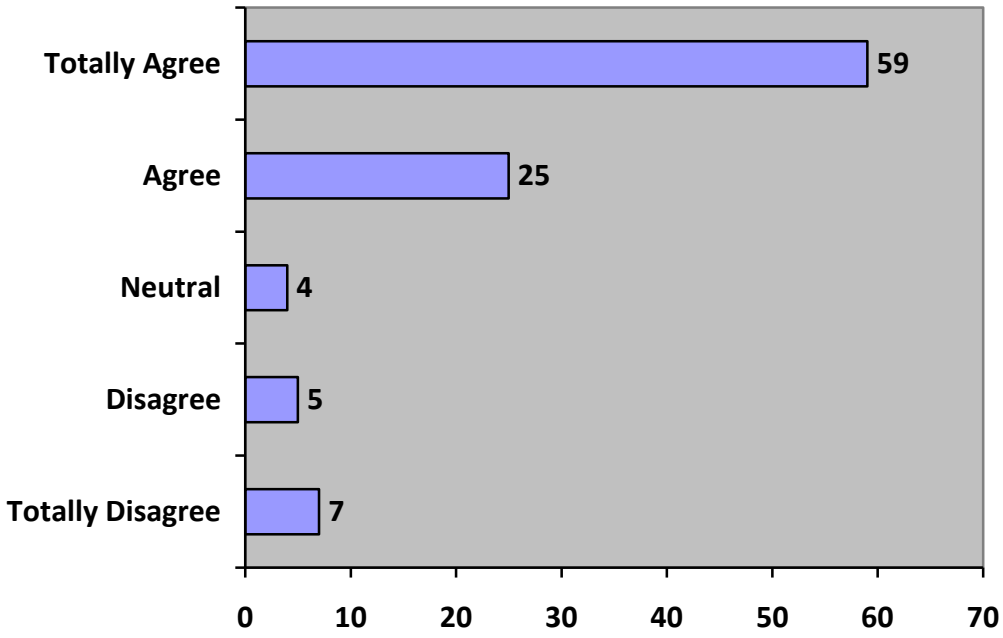
The lack of ambulance availability was considered. The statement that was posed tried to find out if there are no ambulances available, would the response times be affected. The reasons for the lack of ambulances are not defined, these may be anything from not enough vehicles being purchased to the available vehicles being serviced or damaged. It goes without saying that if an ambulance is not available it will not be able to respond to a patient. Thus, if there are fewer ambulances available to provide a service to the same number of patients, it will take them longer to do so. Thus it is logical to assume that if there are only two ambulances it will take them longer to do four calls, than it would take four ambulances to do the same number of calls. The response time will thus increase. The optimal number of ambulances to deliver a service was not considered, thus the number is totally subjective.

When reviewing the results it was found that there seems to be a general lack of understanding in relation to questions based on response times. The researcher then went back and spoke to some of the respondents to find out whether this was the case. It was found that only a small percentage of the Emergency Medical Care Practitioners communicated with understood the statement. An in-depth discussion on the topic showed that the respondents had a basic understanding

of the statement but were not fully conversant with the topic. Even though the respondents act in response to patients on a daily basis they do not understand why they respond and what different factors affect the response times.

Of the respondents 59% totally agreed and 25% agreed. Thus, 84% of respondents reacted positively. Also, 5% disagreed and 7% totally disagreed. Therefore 12% of the respondents reacted negatively and 4% were neutral, which is shown in **Chart 55** below. This may show a lack of understanding of the basic principles that determine response times. It is a huge concern for the managers of Emergency Medical Services if the staff cannot see the relationship between the availability of ambulances and response times.

Chart 55: Lack of ambulance availability results in an increase in response times

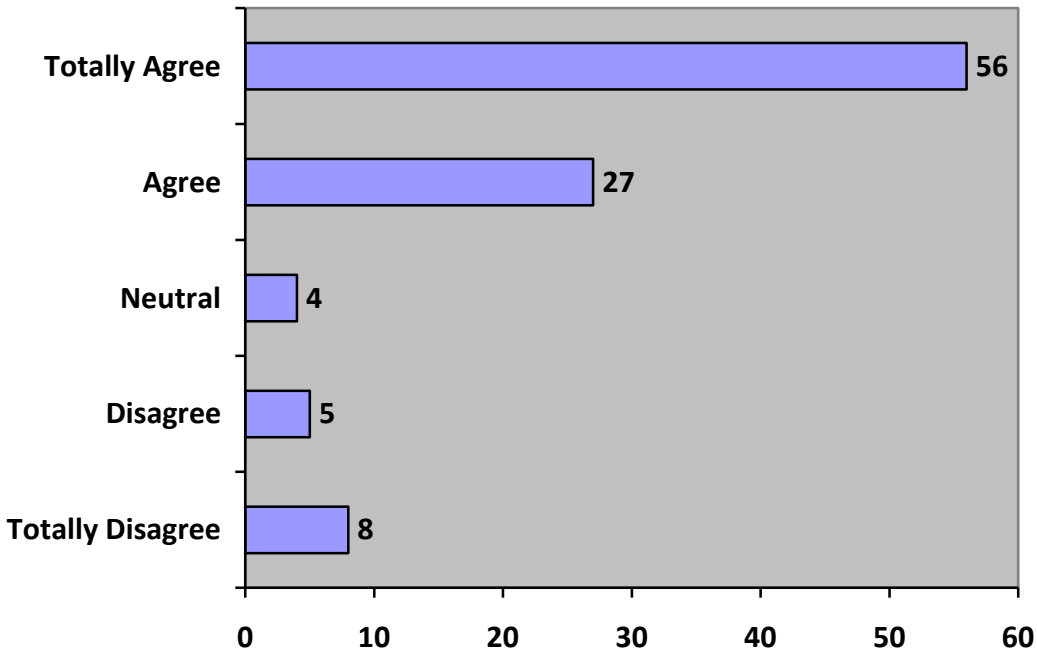


4.3.4.2 Lack of staff results in an increase in response times

The aspect of staff shortage was also considered. The objective of the statement was to establish whether, in the event of a shortage of staff members, the response time would be negatively affected. The staff shortage may be as a result of not enough staff being employed or the available staff being on leave or just absent. Staff discipline may play a big part in staff shortage. Another factor that determines lack of staff is the incorrect management of staff movement. This would mean that leave requests by staff are not correctly approved and monitored. An ambulance requires eight staff members to be operational for twenty-four hours a day. Thus, if there is insufficient staff, an ambulance will not be available and the response times will be poor.

Of the respondents 56% totally agreed and 27% agreed. Thus, 83% of respondents reacted positively. Also, 5% disagreed and 8% totally disagreed. Therefore 13% of the respondents reacted negatively and 4% were neutral. This is shown in **Chart 56** below. Only 56% of the respondents totally agreed. This is similar to the previous question and may also show a lack of understanding of the basic principles that determine response times. It is once again of grave concern to Emergency Medical Services managers that Emergency Medical Care Practitioners do not understand that if you do not have staff to work on an ambulance then that ambulance cannot respond to patients. Therefore, if an ambulance does not respond to a patient there is a logical knock-on effect on response times.

Chart 56: Lack of staff results in an increase in response times



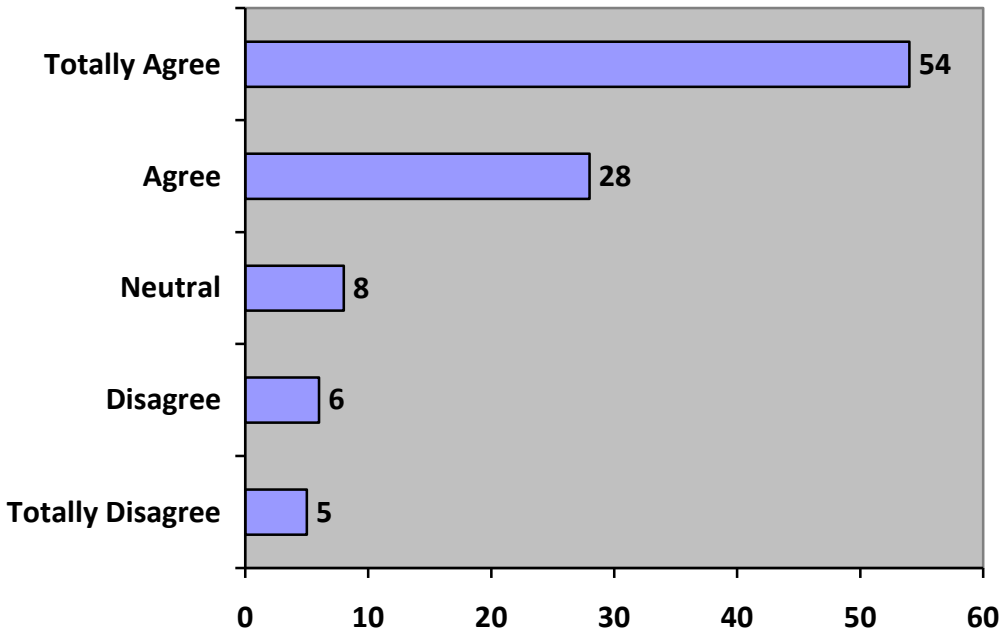
4.3.4.3 Extensive travelling distances result in an increase in response times

The next aspect considered was the distances that ambulances have to travel. In the North West, due to significant distances between communities and health facilities, the travelling distance as well as time can be extensive. Distances can also be affected by road conditions as the Emergency Medical Care Practitioner has to drive slower. The statement's objective was to find out whether respondents feel that the distance has an impact on response times. An ambulance has to obey the speed limit and can only travel a certain distance in a given amount of time. The Road Traffic Act (Act 93 of 1996) section 60 permits an emergency vehicle to drive in excess of the speed limit with due care only if a warning device is used. It is logical that the further the distance the longer it takes for the ambulance to get to the patient and return with that patient to the hospital. This does not only affect the response time but the whole mission time. Mission time is

the time taken from receiving a call until completing that call and the ambulance is available to carry out the next call. This would mean that the further an ambulance has to travel the longer it would take for that ambulance to be available for the next call.

Of the respondents 54% totally agreed and 28% agreed. Thus, 82% of respondents reacted positively. Also, 6% disagreed and 5% totally disagreed. Therefore, 11% of the respondents reacted negatively and 8% were neutral as shown in **Chart 57** below. As with the previous two questions, this may show a lack of understanding of the basic principles that determine response times. It is a worrying trend and management would have to look at the reasons for this situation. This also shows that there is a need for in-service training of staff in this area.

Chart 57: Extensive travelling distances result in an increase in response times



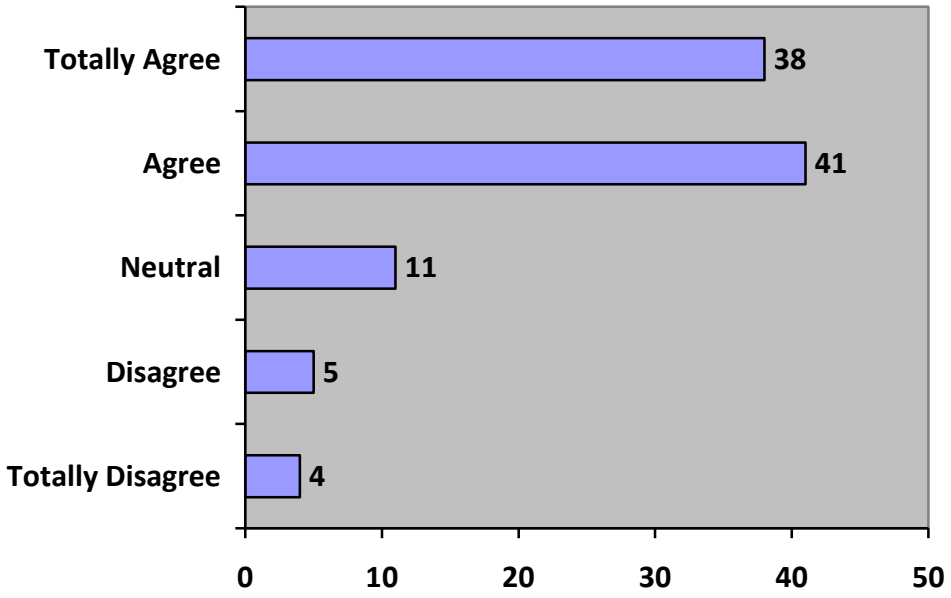
4.3.4.4 Small and widespread rural populations result in an increase in response times

Population density in relation to response times was also considered. In the North West Province a large percentage of the population lives in rural communities. These communities are broken up into scattered small groups or villages. The size of the community normally does not warrant an ambulance based in the area or a health facility, as some communities are extremely small. Some of the calls are also made to farms with a population of 50 people or less. The statement tries to establish whether the distances between communities result in poor response times. As with the previous statement, it is logical that ambulances can only travel a limited distance in a given time.

Of the respondents 38% totally agreed and 41% agreed. Thus, 82% of respondents reacted positively. Also, 5% disagreed and 4% totally disagreed. Therefore 9% of the respondents reacted negatively and 11% were neutral. This

is shown in **Chart 58** below. As with the previous statement this may show a lack of understanding of the basic principles that determine response times. Once again it is a worrying fact that the management of the North West Department of Health would have to look at.

Chart 58: Small and widespread rural populations result in an increase in response times

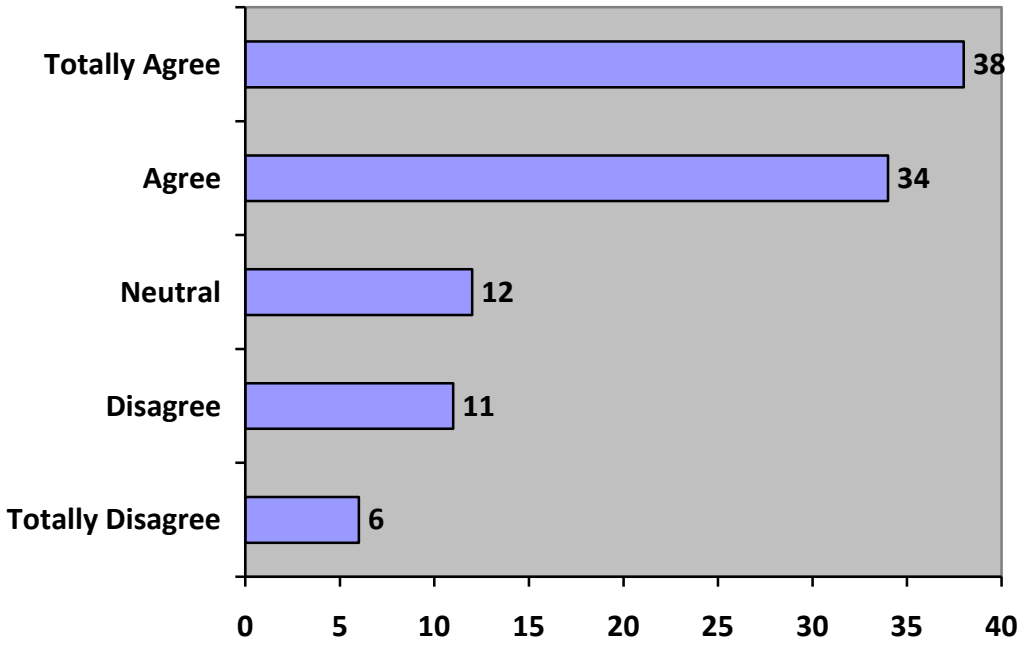


4.3.4.5 Factors beyond our control (factors that are not related to staffing, response times and training) result in an increase in response times

Respondents were asked to consider other factors over which they have no control. This statement tests whether the respondent feels that there are other factors that have an influence on response times. These factors are not specified and are left to the respondent's interpretation. These other factors may include staff attitude, staff absenteeism or any others. As with the previous statement this may show a lack of understanding of the basic principles that determine response times.

Of the respondents 38% totally agreed and 34% agreed. Thus, 72% of respondents reacted positively. Also, 11% disagreed and 6% totally disagreed. Therefore 17% of the respondents reacted negatively. Surprisingly, 12% of the respondents were neutral. This is shown in **Chart 59** below.

Chart 59: Factors beyond our control (factors that are not related to staffing, response times and training) result in an increase in response times



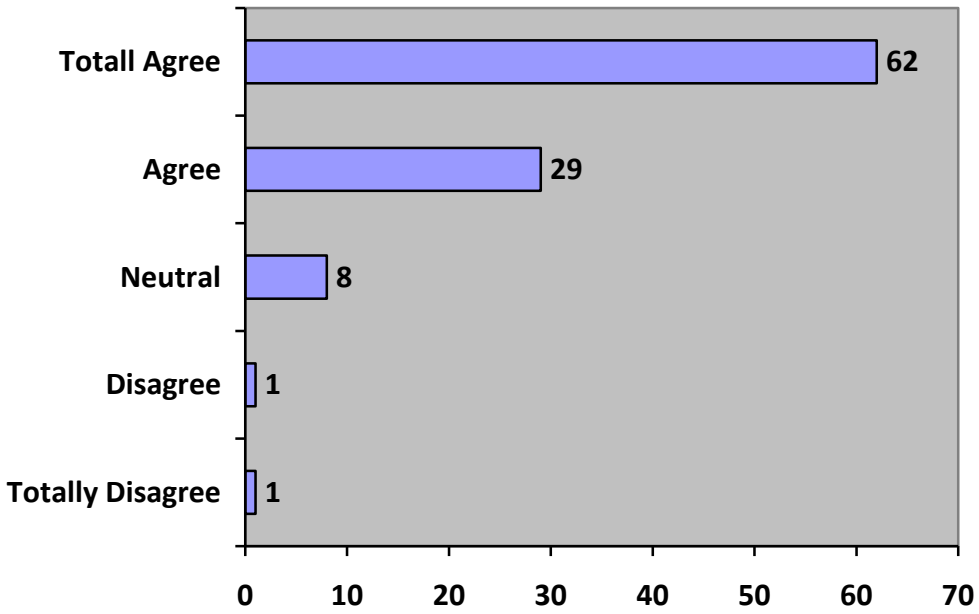
4.3.4.6 Response times impact on patient care

Finally, the impact that response times have on patient care was considered. This statement checks the understanding of the respondent to see whether they agree with it. If a patient is reached early then the treatment of this patient can begin sooner. Medically, it has been proved that this reduces mortality and morbidity. In certain medical conditions, the earlier the treatment begins the better the chances of an exponential increase in the recovery time. Baradarian, et al (2004:6191) state that early intensive resuscitation of

patients with upper gastrointestinal bleeds significantly decreases mortality. Morrison, Verbeek, McDonald, Sawadsky and Cook (2000:2688) state that pre-hospital thrombolysis for acute myocardial infarction significantly decreases all-cause hospital mortality.

Of the respondents 62% totally agreed and 29% agreed. Thus, 91% of respondents reacted positively. Also, 1% disagreed and 1% totally disagreed. Therefore 2% of the respondents reacted negatively. Once again surprisingly, 8% of the respondents were neutral as shown in **Chart 60** below. As with the previous statement this may show a lack of understanding of the basic principles that determine response times.

Chart 60: Response times impact on patient care



4.3.4.7 Response times comments

The surprising trend in the responses to the statements relating to response times is that a relatively large proportion of respondents has no opinion and has responded as neutral. The results are as follows:

- Shortage of ambulances - 3%;
- Shortage of staff - 3%;
- Extensive travelling distances - 4%;
- Small and widespread rural populations - 11%;
- Factors beyond our control (factors that are not related to staffing, response times and training) - 12%; and
- Impact of response times on patient care - 8%.

The researcher found the neutral responses in the area of response times to be quite high. When the other areas that were previously assessed were looked at, like staffing levels and medical qualifications, the same worrying trend was noticed. The neutral responses are thus very high in general.

4.3.5 Warning device

Warning devices are used in Emergency Medical Services to allow the emergency vehicle to navigate through traffic. The warning devices inform other road users of the presence of the emergency vehicle, which can potentially be dangerous as some motorists do not know how to react. There is a tendency amongst some motorists to panic, which poses a danger to themselves and other motorists. Section 60 of the Road Traffic Act (Act 93 of 1996) permits an emergency vehicle to drive in excess of the speed limit but with due care only if a warning device is used.

The following statements in the questionnaire required the respondents to consider and respond to:

- Responding with lights and sirens results in a decrease in response times;
- Responding with lights and sirens improves patient outcomes; and
- Responding with lights and sirens increases the risk of accidents.

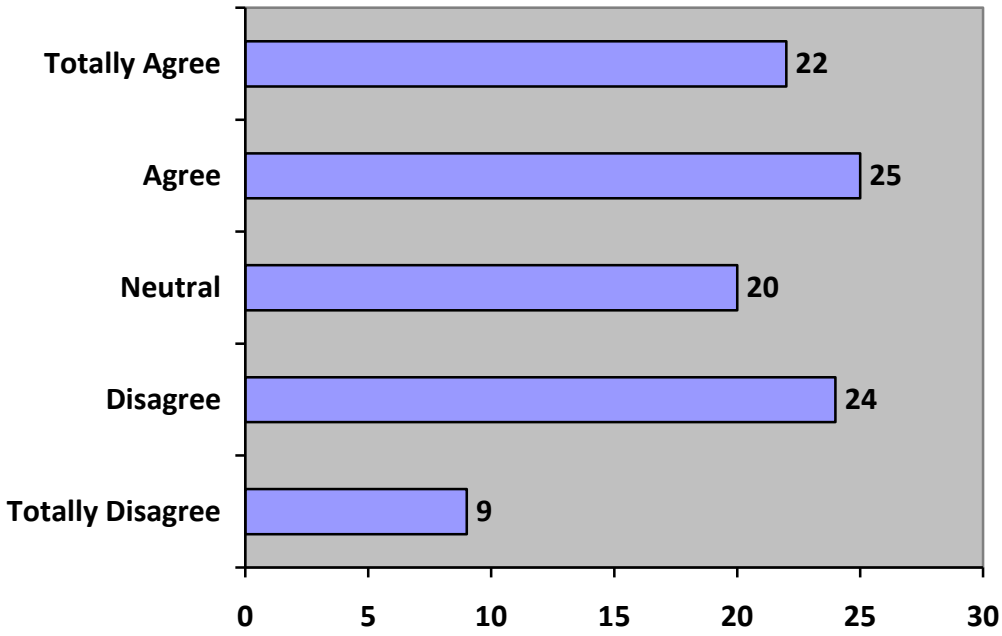
4.3.5.1 Responding with lights and sirens results in a decrease in response times

The impact on response times was measured to see whether responding with lights and sirens actually improves the response times. The reason for this statement was that in rural areas where there are long travelling distances with limited traffic, there may be no need for warning devices. In addition, road conditions in the deep rural areas may be such that a vehicle can only travel at a certain speed, thus the warning device may not be required in such instances. The statement checks whether the respondent feels that by using warning devices they will get to the patient faster. The

statement does not look at aspects of safety to the driver and crew of the ambulance or other road users.

Of the respondents 22% totally agreed and 25% agreed. Thus, 47% of respondents reacted positively. Also, 24% disagreed and 9% totally disagreed. Therefore 33% of the respondents reacted negatively. Surprisingly, 20% of the respondents were neutral. This is shown in **Chart 61** below. All of the Emergency Medical Care Practitioners have utilized a warning device in the performance of their duty and thus should have an opinion whether it takes them longer or not to get to the patient. In addition, warning devices are fitted as standard on all emergency vehicles and Emergency Medical Care Practitioners should have an opinion on their effectiveness.

Chart 61: Responding with lights and sirens results in a decrease in response times



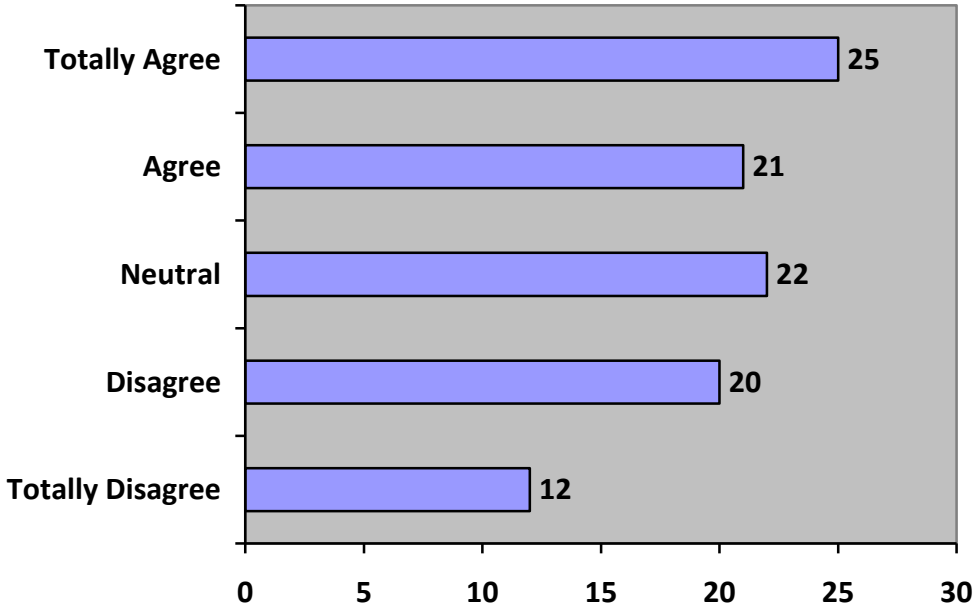
4.3.5.2 Responding with lights and sirens improves patient outcomes

Respondents were asked to consider whether responding with lights and sirens improves patient outcomes. The question checks whether the respondent feels that by using warning devices they will get to the patient faster and thus are able to give the patient better medical care. This was purely a question in relation to response times and not about driving with lights and sirens with a patient in the back of an ambulance. The practice of driving with lights and sirens with a patient in an ambulance puts the patient under greater stress and is therefore not advised. In addition, if the patient is in an ambulance then the patient should already be receiving treatment and speedy arrival at the hospital is not necessary to improve the patient outcomes.

Of the respondents 25% totally agreed and 21% agreed. Thus, 46% of respondents reacted positively. Also, 20% disagreed and 12% totally disagreed. Therefore 32% of the

respondents reacted negatively and 22% were neutral. This is shown in **Chart 62** below. This result is perplexing as Emergency Medical Care Practitioners should have an opinion on the effectiveness of warning devices. The researcher does not have an explanation for this and it may require further research.

Chart 62: Responding with lights and sirens improves patient outcomes



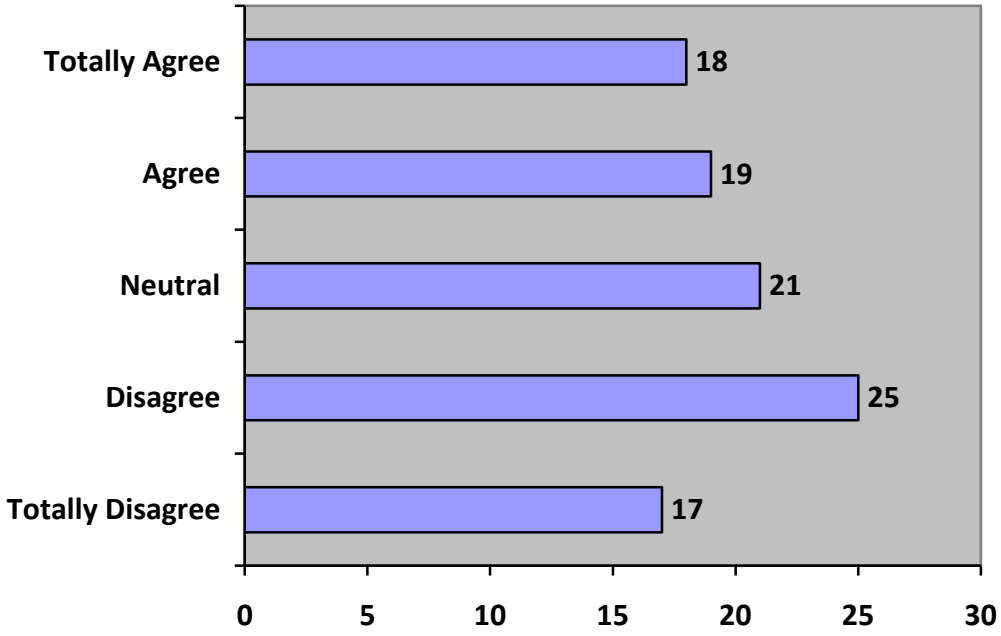
4.3.5.3 Responding with lights and sirens increases the risk of accidents

The question was also posed whether responding with lights and sirens increases the risk of accidents. It intends to check whether the respondent feels that the use of warning devices increases the risk of an accident due to the fact that the rules of the road are not abided by. This would also show how safe Emergency Medical Care Practitioners feel when responding to a patient.

Of the respondents 18% totally agreed and 19% agreed. Thus, 37% of respondents reacted positively. Also, 25%

disagreed and 17% totally disagreed. Therefore 42% of the respondents reacted negatively and 21% were neutral. This is shown in **Chart 63** below. As has been stated earlier, all of the Emergency Medical Care Practitioners have utilized a warning device in the performance of their duty. Therefore Emergency Medical Care Practitioners should have an opinion on whether they felt unsafe when responding in an emergency vehicle with lights and sirens.

Chart 63: Responding with lights and sirens increases the risk of accidents



4.3.5.4 Warning device comments

The surprising trend in the question relating to warning devices is that a relatively large number of respondents have responded as neutral. In response to all three statements represented in graphs 61, 62 and 63, a significant percentage of respondents were neutral as shown below:

- Responding with lights and sirens results in a decrease in response times - 20%;
- Responding with lights and sirens improves patient outcomes - 22%; and

- Responding with lights and sirens increases the risk of accidents - 21%.

This is an alarming factor as it is approximately one in five respondents. It would mean that they either do not have an opinion or are unsure of the question. From personal experience the researcher would have been able to give a definite answer in relation to the statement. This is due to the fact that the researcher has previously worked in that environment. Thus each respondent should have been able to do the same as it is part of their everyday duties.

Therefore this is an area that necessitates further research to understand the responses. The issue was taken up with respondents and there seems to be an adequate understanding of the question. However, when an in-depth discussion was held it was found that the respondents are too operationally minded. They only focus on the area they work in and not on the broader or strategic picture. There is a great need for the training of Emergency Medical Care Practitioners in areas other than the clinical aspects.

4.3.6 Patient care

Patient care is one of the crucial aspects within Emergency Medical Services. Firstly, it is the treatment of the patient on the scene and in transit and finally the transport to the nearest appropriate health facility. The Emergency Medical Care Practitioner has to be capable of providing the patient with quality medical care on arrival at the patient and during transit.

The following statements in the questionnaire requested the respondents to consider and respond to:

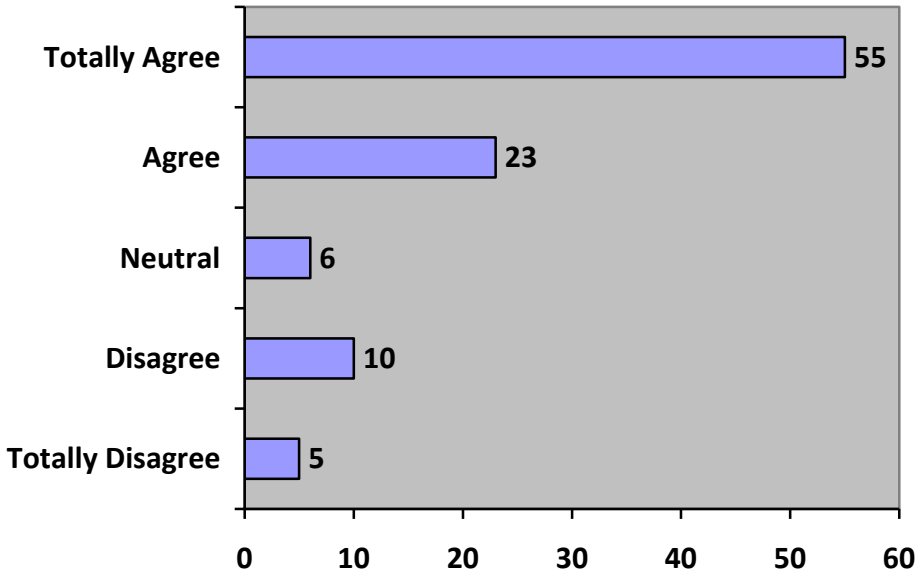
- Insufficient equipment levels on ambulances result in poor patient care;
- Poorly maintained equipment results in poor patient care; and
- Non-adherence to equipment checklists results in poor patient care.

4.3.6.1 Insufficient equipment levels on ambulances result in poor patient care

When trying to ascertain from the respondents whether insufficient equipment levels on ambulances result in poor patient care, the following was found. The statement tries to ascertain whether the respondent feels that they should have a certain basic set of equipment in their vehicle to ensure the correct treatment of patients. It should be noted that this statement did not try to assess the skills level of the Emergency Medical Care Practitioner, but assumed that the Practitioner was competent. The Emergency Medical Care Practitioners need a set of minimum equipment to perform their duties adequately. The equipment is checked on a daily basis during the handover process by the Emergency Medical Care Practitioner at the start of every shift. The importance of checking equipment cannot be overemphasized as it has to be in good working order when the need to use it arises. The basic equipment level per qualification is attached as Annexure B. An ambulance could be used for any level of staff by basically putting the correct equipment into the vehicle. Thus if an Emergency Medical Care Practitioner has an advanced qualification, the advanced life support equipment can be placed in the vehicle and the vehicle becomes an advanced life support vehicle.

Of the respondents 55% totally agreed and 23% agreed. Thus, 88% of respondents reacted positively. Also, 10% disagreed and 5% totally disagreed. Therefore 15% of the respondents reacted negatively and 6% were neutral. This is shown in **Chart 64** below. As stated earlier, equipment is an essential part of patient care and thus the neutral responses are surprising. As has been previously mentioned, there seems to be a lack of in-depth understanding of the strategic aspects of Emergency Medical Services by the respondents.

Chart 64: Insufficient equipment levels on ambulance result in poor patient care



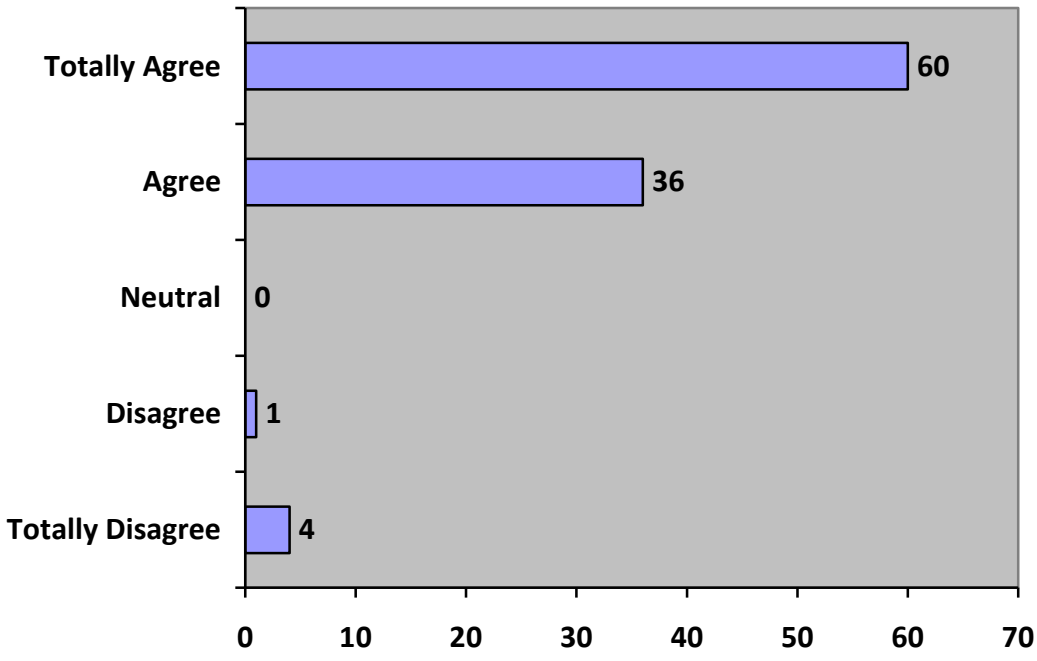
4.3.6.2 Poorly maintained equipment results in poor patient care

The next logical step was to check whether poorly maintained equipment results in poor patient care. Even though the statement may seem logical and obvious it was important to see whether the respondents also saw it that way. The statement posed checks whether the respondents feel that they should have their equipment in their vehicle maintained to a certain level, to ensure that the patients are treated correctly. It is obvious that if an item of equipment is

not operating optimally it could be detrimental to the patient's well-being. In certain instances the failure of an item of equipment could result in the loss of life.

Of the respondents 60% totally agreed and 36% agreed. Thus, 96% of respondents reacted positively. Also, 1% disagreed and 4% totally disagreed. Therefore 5% of the respondents reacted negatively. This is shown in **Chart 65** below. None of the respondents are neutral. As stated earlier, equipment is an essential part of patient care and this is probably the response that is expected. If a piece of equipment is not working correctly it will affect the patient, as you will not be able to utilize the equipment on the patient when it is needed. Emergency Medical Care Practitioners are taught in their training about the importance of their equipment. The researcher thus expected that any person who is medically trained would totally agree with this statement.

Chart 65: Poorly maintained equipment results in poor patient care

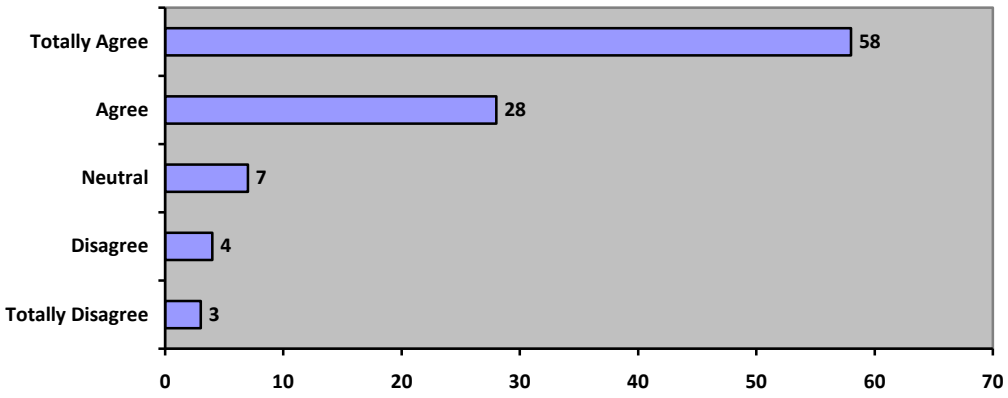


4.3.6.3 Non-adherence to equipment checklists results in poor patient care

Finally, it was put to respondents whether non-adherence to equipment checklists results in poor patient care. The statement checks to see whether the respondent feels that they should check their equipment in their vehicle before embarking on a shift to ensure that the patients are treated correctly. Annexure C is a copy of the standard equipment checklist used.

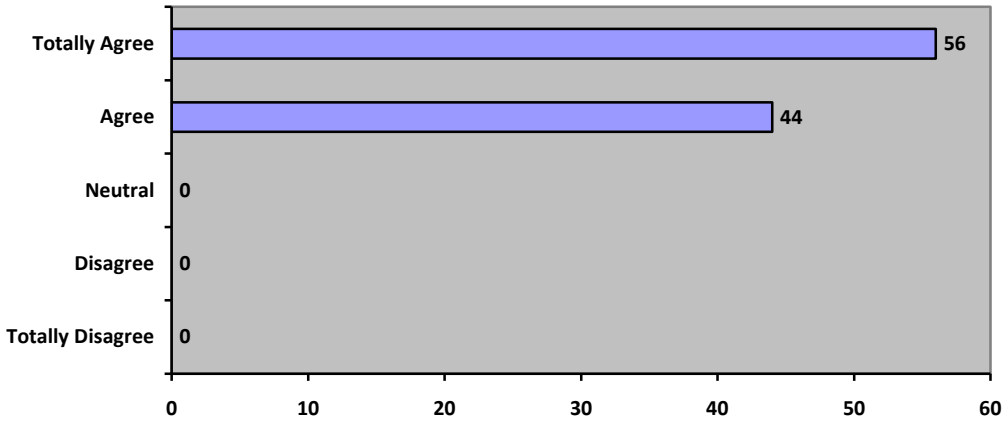
Of the respondents 58% totally agreed and 28% agreed. Thus, 86% of respondents reacted positively. Also, 4% disagreed and 3% totally disagreed. Therefore 7% of the respondents reacted negatively. This is shown in **Chart 66** below. As stated earlier, equipment is an essential part of patient care and this is probably the response that is expected.

Chart 66: Non-adherence to equipment checklists results in poor patient care



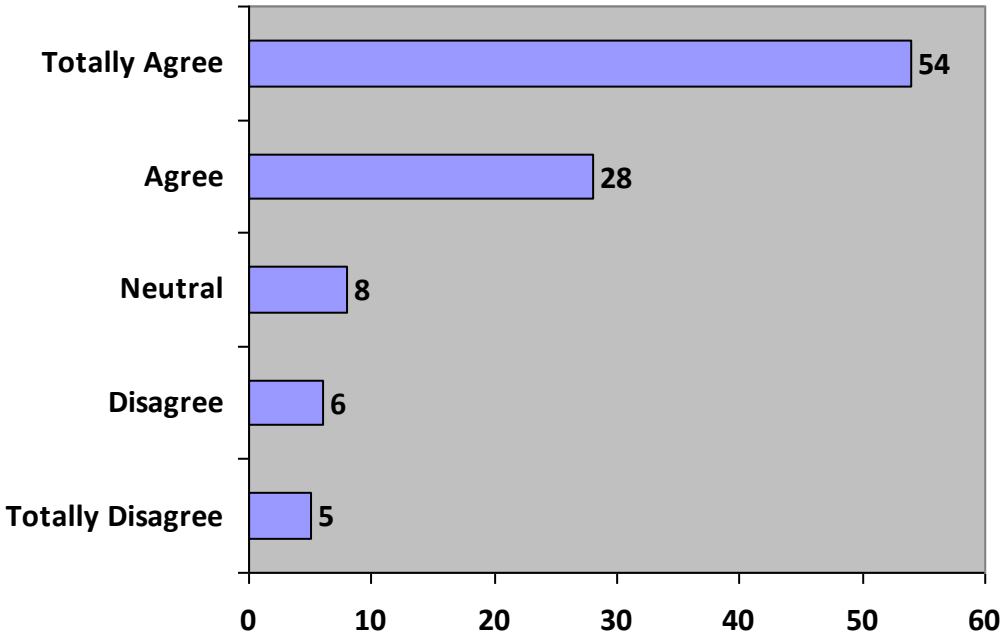
When College Management is looked at, 56% of the respondents totally agreed and 44% agreed. Thus, 100% of respondents reacted positively as shown in **Chart 67** below. This is the expected response as these are the trainers teaching the Emergency Medical Care Practitioners on the importance of checklists.

Chart 67: Non-adherence to equipment checklists results in poor patient care (College Management)



When operational staff members are considered, 54% of the respondents totally agreed and 28% agreed. Thus, 82% of respondents reacted positively. Also, 6% disagreed and 5% totally disagreed. Therefore 8% of the respondents reacted negatively as shown in **Chart 68** below. This seems to show that the lessons taught to staff either did not filter through or the lessons learnt have been forgotten.

Chart 68: Non-adherence to equipment checklists results in poor patient care (operational staff)



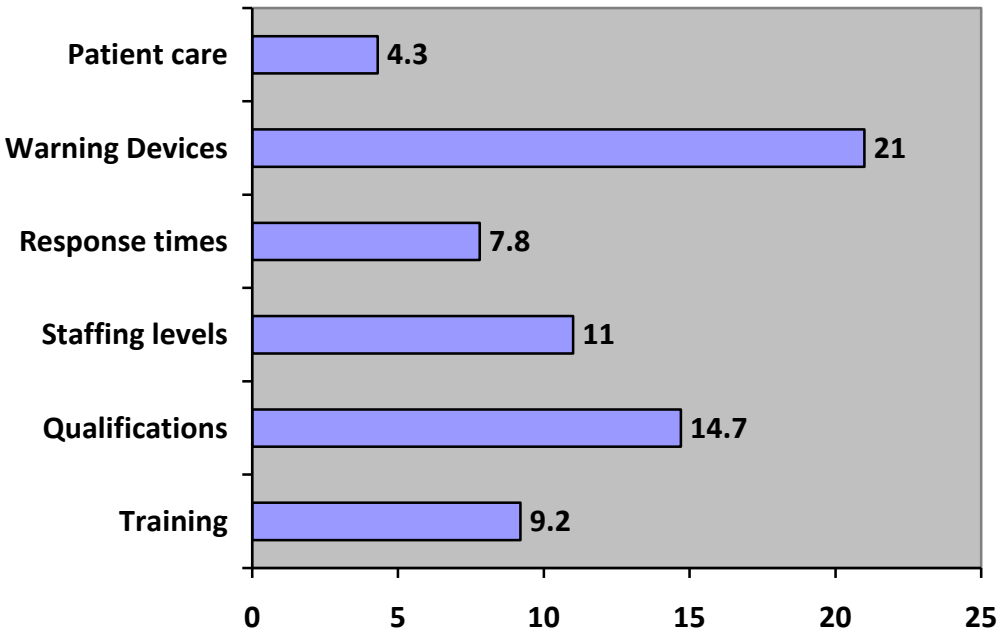
4.3.6.4 Patient care comments

It is surprising that the response that is expected is only in relation to poorly maintained equipment, whilst insufficient equipment does not elicit a similar response. In both instances the equipment is not available for use by the Emergency Medical Care Practitioner. There is also a seven% neutral response. This should not be found when it comes to compliance issues. It is imperative that the Emergency Medical Care Practitioner should check equipment. Checklists should be in place and it is important that the checklists are quality assured and monitored on a daily basis. However, it is also important that training is given to staff on how to fill in a checklist. When a checklist is endorsed, the person doing the checking should actually be at the vehicle and not in an office just marking off each item.

4.3.7 Neutral responses

When all the responses are looked at there are a large number of neutral responses. As has been stated previously, this is very surprising. The possible reasons could be no interest by staff members in career building, no ambition and abnormal deviations in the work place. An average of the neutral responses per section was taken to illustrate this. **Chart 69** below is a graphical representation thereof.

Chart 69: Average representation of neutral responses



CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This Chapter has been broken down into different areas with the objective of dealing with each area separately:

5.1 TRAINING

The area that seems to need the most attention is that of training. The focus in Emergency Medical Services has been on the medical training of staff members. This is most likely due to the fact that the bulk of the work done in the field is medically related. However, in the analysis of the research it is found that there is a lack of understanding the level of training required in Emergency Medical Services. This research shows that there is a need for medical training, but the greater need is for training other than medical. When the responses from the questionnaires are looked at it seems as if the Emergency Medical Care Practitioners are only inwardly focused. They do not see the role of Emergency Medical Services in relation to the whole Health Department. There seems to be a silo mentality. Thus the training that is needed could take the form of induction training. An amended training policy is given in Annexure D and deals with all kinds of training within Emergency Medical Services. There needs to be an intense focus in the induction training on the service delivery issues that affect Emergency Medical Services as well as the issue that the Emergency Medical Care Practitioner may not consider important, but which has an impact on how they perform their duties and how they serve their communities. The issues mainly relate to the fact that Emergency Medical Care Practitioners see themselves as isolated from the Health Department and thus have a very

narrow focus. There is a distinct 'us' and 'them' mentality. Most of the responses by the Emergency Medical Care Practitioners in the questionnaires display an inward focus; there is no consideration for the needs of the community. The responses are to a certain extent in a vacuum and are profession-specific. The focus of Emergency Medical Services should be more orientated towards the health sector as a whole, with a specific focus on service delivery.

The focus needs to be placed on the training of managers as the responses in the questionnaires received from managers do not reflect a management position but are rather more operational in nature. Managers need to provide direction and if they are operational-minded then their decisions will reflect that as well. If the management cadre does not espouse the strategic vision of the North West Department of Health, then the Emergency Medical Services will stagnate. It is important to check whether the vision of the North West Department of Health has been communicated to the said managers or whether it still needs to be communicated. If it has indeed been communicated, has it been adequately explained to them?

It is imperative that managers at a lower level within Emergency Medical Services are familiar with the changes and development in the service. If these managers are not taken on board with any new endeavours then these endeavours are destined to fail. The managers would thus need to upgrade their knowledge to ensure that they are moving with the times. It is only then that the quality of service can be improved. Managers at all levels need to come together and move as a cohesive unit.

Thus, all station managers and shift managers should be trained to the level of Emergency Care Technicians (ECT) to improve the quality of care within Emergency Medical Services. Managers that were appointed before the qualification was introduced must be assisted to obtain the qualification. In addition, all new appointments to the management ranks must have the minimum qualification of Emergency Care Technician. All managers at lower levels should be compelled to complete the training within five years. It is important that managers are trained to at least the lowest level of a tertiary qualification, i.e. the Emergency Care Technician. The tertiary training brings about a change in mind-set. This has been observed by the researcher in interactions with Emergency Medical Care Practitioners who have undertaken the Emergency Care Technician programme. The outlook of this cadre towards service delivery is different. This could probably be attributed to the way the training is done with a focus on empowering the student holistically. This would help to change the mind-set of managers employed within the service. A retention strategy should also be put in place to ensure that the trained staff members remain within the province for at least the length of the time it took to train them.

To ensure that the improvement is sustainable this needs to apply to all new appointments as well. Thus, no new appointments of shift senior and station manager should be made without at least an Emergency Care Technician qualification.

Once the management cohort has been trained the training should be rolled out to all Emergency Medical Care Practitioners.

5.2 COMPUTERIZATION

The information gathered in the North West Emergency Medical Services is a paper-based system which made the verification of the data accuracy difficult. The system requires computerization to ensure that the data is more accurate. This needs to be done in the following areas:

5.2.1 Vehicle monitoring

The monitoring of vehicles needs to be done by means of real-time tracking. This will provide accurate response times which are computer-generated and tamper-proof. If the response time information is accurate then it can be monitored and acted upon. Thus the conclusions or assumptions made would be reliable and decisions made would have an impact upon the system that could be accurately measured. Based on this information, vehicles can then be placed in specific areas of need. An example would be that an ambulance can be placed strategically along a national road during a peak period to ensure a more rapid response to any potential accident. That would help to reduce the response times. The placement of vehicles at the point of need would become more accurate as more data is obtained.

An additional aspect would be the accurate utilization of resources as the North West Department of Health would know the location of the vehicle at any given time. This would have an additional benefit as there would be a decrease in unnecessary mileage travelled. If an Emergency

Medical Care Practitioner is aware that there is a system that monitors the movement of the vehicle, chances are that the unnecessary driving of the vehicle will be reduced. This will result in saving fuel and will decrease maintenance cost. The cost saving could be utilized to purchase more vehicles.

However, the monitoring of these vehicles needs to be done by an independent entity to prevent collusion. Collusion between staff members renders a very effective system pointless. If the person monitoring the system does not inform management when a vehicle is been abused or immediately acts upon the abuse, then the system is ineffective. Thus an independent company needs to be utilized to ensure quality assurance.

5.2.2 Centralized communication system

All calls should be routed via a single communication centre. At present there are four communication centres in the North West Department of Health and the communication between them is poor. Thus patients who are found on the boundaries between these centres sometimes are left without any coverage. If there are no boundaries within the North West Province then there can be a seamless flow of patients. No patient will thus be lost within the system and this will also prevent the duplication of calls. Thus more than one ambulance will not be sent to the same patient, or even worse, no ambulance sent to a patient as one communication centre is under the impression that the neighbouring centre is servicing the call. This will also improve coordination between districts and sub-districts. In effect, there would not be an area in the province where there will be any contestation about who will send an ambulance to any given patient. Emergency Medical Care Practitioners on the ground

would thus not be able to refuse a call by indicating that it is in an area they do not cover. This will provide a seamless Emergency Medical Services in the whole province.

A centralized communication system would also facilitate the deployment of resources in major incidents and disasters. The boundaries between districts do not become an issue. Resources can thus be seamlessly moved within the province. The movement of patients across boundaries is therefore also not a problem. In addition, if a vehicle is moving through a sub-district, it could uplift patients from that sub-district, thus freeing up resources in that sub-district. This prevents two vehicles from two different sub-districts along the same route from both being positioned at a hospital, when one vehicle will suffice.

As with the monitoring of the tracking system, the communication centre should also be independent. As mentioned earlier, this prevents collusion. It also allows the Department to develop a service level agreement with the provider that would contain certain criteria with attached penalties.

A single computerized communication centre will ensure an improvement in response times by reducing delays in the relaying of information. In order to do this the communication centre would have to have a computerized dispatch system that has an early warning system. The computerized dispatch system would have to be linked to the tracking system to further improve the way resources are utilized.

5.2.3 Management reports

At present, the reports that are produced are all paper-based. Thus the information utilized in the decision-making process is not accurate, which has an impact on the decisions that are made to manage the Service. A more proactive form of report produced by a computerized system needs to be available on a weekly, monthly, quarterly and yearly basis. These reports should be used to allow management to interact with the current situation and to correct errors or problems in time. The said reports would also allow managers to be more proactive in managing resources. Managers would be able to rectify problems in their initial stages and thus prevent bigger problems at a later stage.

5.2.4 Vehicle management system

The Emergency Medical Services are a vehicle-based system. Without fully functional vehicles the system is inefficient. There needs to be a system that monitors vehicles on a daily basis, a system that informs managers when vehicles should be serviced, licensed or rested to prevent breakage. Thus a preventative maintenance schedule should be set up. At present Emergency Medical Services are too reactive in the way they deal with vehicles.

Additional vehicles should be purchased to be utilized when operational vehicles require preventative maintenance. These vehicles should be supernumerary to the operational ambulance fleet. Such vehicles would also be used to rest certain vehicles to ensure that those vehicles do not break down. A considerable number of the Emergency Medical Service vehicles suffer breakdowns, as they are utilized around the clock without any rest.

5.3 STAFFING LEVEL

The number of Emergency Medical Care Practitioners needed is based on the number of vehicles that will be operational. Thus it is important to first do an accurate reflection of the number of emergency vehicles needed. The number of vehicles needed is based on population density, the number of calls and how long it takes to service the call. It is, however, very difficult to ascertain as all the statistics are paper-based and thus their accuracy cannot be verified. The national norm, utilized by the National Treasury to measure provinces against one another, of one ambulance per 10 000 people, is also not financially viable. The cost of placing 350 ambulances in the North West Province is unaffordable. Other mechanisms would have to be found to determine the number of ambulances to be used. A scientific formula has been created and is attached as Annexure E.

Once the correct vehicle figure has been obtained, the vehicle should be staffed with a minimum of eight staff members. This would allow for a vehicle to have two Emergency Medical Care Practitioners twenty-four hours a day. If leave and other human resource issues are taken into account, this figure raises the staff members per ambulance to ten. Thus this will determine the number of Emergency Medical Care Practitioners required. Each ambulance should have at least one Emergency Care Technician or an Intermediate Life Support Practitioner per shift. As has been shown, the number of staff trained at both levels is very limited and thus a concerted effort will have to be made to increase the qualification level of staff.

5.4 RESPONSE TIMES

As stated earlier, the response times are calculated manually and are therefore not totally accurate. It has been noted that response times are a constant concern to the North West Department of Health as this situation results in numerous complaints being received by the Department. It is difficult to determine which areas have to be corrected to improve the response times if the accuracy of the data given cannot be verified. As the system is paper-based it cannot be accurately ascertained whether the figures are correct. Even if the information is audited there are too many variables that cannot be accounted for. To truly determine the accuracy of the response times a computerized system would have to be put in place and monitored. Once the information from such a system is verified, then accurate assumptions can be made.

Response times are affected by numerous factors as outlined in the research. As previously stated, the Emergency Medical Care Practitioners are very operational in their thinking and thus have not considered all the variables. For this reason there is no single solution to reduce response times. Each area that has an effect on the response times will have to be looked at individually. With a paper-based system the response times cannot be broken down into the individual components. In a computerized system each individual time segment that makes up the response time can be measured. Management can then focus on the area that is causing the delay and implement corrective action. For example, if there is a delay from the time the communication centre informs the emergency vehicles of a call to the time the Emergency Medical Care Practitioners actually respond to the call. The manager would then be able to find out why the Emergency

Medical Care Practitioners are moving so slowly to the emergency vehicle.

5.5 WARNING DEVICES

In the responses to the questionnaires regarding warning devices the respondents were very indecisive. There needs to be a process which weighs up the benefit of the use of warning devices as opposed to the safety factor. Each time an emergency vehicle responds it results in the Emergency Medical Care Practitioners being placed at risk. The emergency vehicle also poses a risk to other road users and pedestrians.

The State does not insure any of its vehicles and thus carries the risk. This has a huge financial impact when vehicles are involved in accidents. These vehicles cannot be replaced and are lost to the service. The cost factor of not insuring vehicles as opposed to the replacement costs also needs to be considered. This would, however, have to be a policy shift from the National Treasury and much more in-depth research will have to be done in the area of insuring government vehicles.

Mathematically, if a vehicle is travelling at 120 kilometres per hour it would take 30 minutes to travel 60 kilometres. If the same vehicle was travelling at 140 kilometres per hour for the same 30 minutes the vehicle will travel for 70 kilometres. Thus, if all conditions are equal the vehicle will travel further. However, his is not true in the case of city driving as there are numerous stops and starts which decrease the time gains. Further research needs to be done to investigate whether there is value in the use of warning devices.

5.6 PATIENT CARE

Patient care is an area that needs attention. The Emergency Medical Care Practitioners that took the time to respond to the questionnaire have a limited grasp of the importance of highly skilled staff to improve patient care. This is evident from the responses that were given to statements made, as has been discussed earlier. The outcomes of patients improve if they receive definitive medical care earlier. If patients are treated by Emergency Medical Care Practitioners who have a higher level of medical training, then the patient receives the correct treatment sooner, which reduces mortality and morbidity. The most effective way to improve the quality of patient care is to improve the skills level of staff. The improvement of this medical training is paramount. The said training could be formal or non-formal.

It is important to note that the North West Department of Health does have a Continuous Professional Development programme. However, the Emergency Medical Care Practitioners, though given opportunities, do not always attend these sessions. It is imperative that Emergency Medical Care Practitioners are encouraged to participate in this programme. The benefit of this programme cannot be overemphasized.

5.7 VEHICLE CHECKLIST

It is imperative that each vehicle has a checklist. The checklist needs to be filled in at the beginning of every shift. Thus each vehicle should have two completed checklists per day. The checklist file should be checked daily by the Shift Senior and weekly by the Station Manager. This is an

important way to ensure quality assurance. Any piece of equipment that is missing could be detrimental to patient care and outcomes.

A loss form should be filled in for any missing or damaged piece of equipment to ensure replacement or repair. If an item is damaged or lost it should be replaced immediately, even if a disciplinary procedure is to be followed. The disciplinary procedure should not delay the replacement of the item, as the lack of some essential items of equipment could result in the loss of lives.

Equipment should also be maintained on a regular basis and all items should have a routine maintenance schedule. Items that have an expiry date should be clearly marked and not used past that date.

Checklists should include redundancies wherever possible to ensure that if an item fails there is a backup. For example, the main item may be electronic, whilst the backup could be manual. In the case of an emergency it is important to have another item of equipment on hand if one fails. This prevents the loss of life, and also protects the North West Department of Health medico-legally.

It is important to note that a checklist is ineffective if not monitored by management. This is to prevent Emergency Medical Care Practitioners from just filling in the form without actually checking each item. It is also important to inform and train Emergency Medical Care Practitioners on how to fill in the form and why they are completing the form.

5.8 AREAS FOR FUTURE STUDY

This study has resulted in a few unanswered questions that require further research. These matters requiring further research are provided hereunder as follows:

- The aspect of the safety and value of utilizing emergency warning devices needs some consideration;
- The insuring of government vehicles needs to be researched further;
- The service delivery model that will deliver an optimal service will also have to be considered; and
- Finally, the large-scale training of Emergency Medical Care Practitioners and thereafter the retraining of said practitioners needs consideration.

5.9 CLOSING STATEMENT

Though the study was successful conducted, it highlighted the need for other areas of research within Emergency Medical Services. This is especially true in the South African context. Despite having numerous years of experience in the field of Emergency Medical Services the researcher was enlightened in a few areas of the research. Hopefully the research will add to the body of knowledge within the profession and assist in the development of future Emergency Medical Services systems.

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Annexure A: Capabilities for EMRS staff

It should be noted that in certain instances all three levels could perform the same function. This, however, is to varying degrees and there should be adherence to Health Professional Council of South Africa protocol guidelines.

The following information was obtained from the Health Professional Council of South Africa.

1- Patient assessment		ECP-B	ECP-I	ECT	ECP-A
1.1	Primary survey	Yes	Yes	Yes	Yes
1.2	Secondary survey	Yes	Yes	Yes	Yes
1.3	Taking and recording signs				
	1.3.1 Pulse	Yes	Yes	Yes	Yes
	1.3.2 Blood pressure	Yes	Yes	Yes	Yes
	1.3.3 Respiration	Yes	Yes	Yes	Yes
	1.3.4 Skin condition	Yes	Yes	Yes	Yes
	1.3.5 Level of consciousness (Glasgow coma scale)	Yes	Yes	Yes	Yes
	1.2.5 Pupil assessment	Yes	Yes	Yes	Yes
1.4	Examination for sensory defect	Yes	Yes	Yes	Yes
1.5	Examination for motor defect	Yes	Yes	Yes	Yes
1.6	Examination of abdomen	Yes	Yes	Yes	Yes
1.7	Examination of chest	Yes	Yes	Yes	Yes
1.8	Examination of musculo-skeletal system	Yes	Yes	Yes	Yes
1.9	Trauma score revised	Yes	Yes	Yes	Yes
1.10	Auscultation of chest and	Yes	Yes	Yes	Yes

	abdomen				
1.11	Triage	Yes	Yes	Yes	Yes

2-Airway management, breathing aids and oxygen therapy		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
2.1	Opening the airway using various manoeuvres	Yes	Yes	Yes	Yes
2.2	Insertion of oro-pharyngeal airways	Yes	Yes	Yes	Yes
2.3	Preparation and insertion of endo-tracheal tube	No	No	No	Yes
2.4	Use of Magill forceps to remove foreign bodies	No	No	No	Yes
2.5	Needle Cricothyroid membrane puncture	No	Yes	Yes	Yes
2.6	Surgical cricothyroidotomy	No	No	No	Yes
2.7	Suctioning	Yes	Yes	Yes	Yes
2.8	Abdominal thrust	Yes	Yes	Yes	Yes
2.9	Chest thrust	Yes	Yes	Yes	Yes
2.10	Finger sweep	Yes	Yes	Yes	Yes
2.11	Back slap (small child/infants)	Yes	Yes	Yes	Yes
2.12	Mouth-to-mouth-to-nose/mouth-to-mask ventilation (with and without valve)	Yes	Yes	Yes	Yes
2.13	Bag-valve-mask ventilation	Yes	Yes	Yes	Yes
2.14	Use of mechanical resuscitators	Yes	Yes	Yes	Yes
2.15	Administration of oxygen	Yes	Yes	Yes	Yes
2.16	Use of various face masks	Yes	Yes	Yes	Yes
2.17	Use of nasal cannula for	Yes	Yes	Yes	Yes

	oxygen administration				
2.18	Use of various one-way valve mouth ventilatory devices	Yes	Yes	Yes	Yes
2.19	Assembling of manual ventilatory equipment	Yes	Yes	Yes	Yes
2.20	Manual ventilation in adults, children and infants	Yes	Yes	Yes	Yes
2.21	Use of mechanical ventilators	No	No	No	Yes
2.22	Naso-gastric tube insertion	No	No	No	Yes
2.23	Continuous positive airway pressure (CPAP)	No	No	No	Yes
2.24	Positive end-expiratory pressure (PEEP)	No	No	No	Yes

3-Cardio-pulmonary resuscitation		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
3.1	One-man CPR for an adult, child and infant	Yes	Yes	Yes	Yes
3.2	Two-man CPR for an adult, child and infant	Yes	Yes	Yes	Yes
3.3	CPR with several rescuers	Yes	Yes	Yes	Yes
3.4	Pre- cordial thump (witnessed) arrest	Yes	Yes	Yes	Yes
3.5	Intubations during CPR	No	No	No	Yes
3.6	IV drug administration (on medical protocol)	No	No	Yes	Yes
3.7	EMS access procedures	Yes	Yes	Yes	Yes
3.8	Post-successful CPR care	Yes	Yes	Yes	Yes

4-Advanced cardiac life support	**ECP-B**	**ECP-I**	**ECT**	**ECP-A**

4.1	Preparation and attachment of ECG monitoring equipment	No	Yes	Yes	Yes
4.2	Electrical defibrillation	No	Yes	Yes	Yes
4.3	Automated electrical defibrillation	Yes	Yes	Yes	Yes
4.4	Cardio-version (on medical protocol)	No	No	No	Yes
4.5	Vagal manoeuvres (on medical protocol)	No	No	No	Yes
4.6	Peripheral intravenous cannulation	No	Yes	Yes	Yes
4.7	Blood glucose finger prick and use of oral glucose	Yes	Yes	Yes	Yes
4.8	IV administration of drugs in emergencies (according to protocol)	No	No	Yes	Yes
4.9	Endotracheal intubation	No	No	No	Yes
4.10	Surgical cricothryoidotomy	No	No	No	Yes
4.11	Pulseless rhythm interpretation and management	No	No	No	Yes
4.12	Dysrhythmia interpretation and management (according to protocol)	No	No	No	Yes
4.13	External cardiac pacing	No	No	No	Yes
4.14	Intra-osseous infusions	No	No	No	Yes
4.15	Femoral vein catheterization	No	No	No	Yes
4.16	Central venous lines	No	No	No	No

5- Shock		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
5.1	Positioning of patient	Yes	Yes	Yes	Yes

5.2	Use of oxygen				
	5.2.1 Nasal cannula	Yes	Yes	Yes	Yes
	5.2.2 Simple face mask	Yes	Yes	Yes	Yes
	5.2.3 Diluter type mask	Yes	Yes	Yes	Yes
	5.2.4 Humidification	Yes	Yes	Yes	Yes
	5.2.5 Nebulization (according to protocol)	No	Yes	Yes	Yes
	5.2.6 Reservoir bag	Yes	Yes	Yes	Yes
5.3	Maintaining body temperature	Yes	Yes	Yes	Yes
5.4	PASG suit	No	Yes	Yes	Yes
5.5	Peripheral intravenous cannulation	No	Yes	Yes	Yes
5.6	Use of fluids				
	5.6.1 Crystalloids	No	Yes	Yes	Yes
	5.6.2 Colloids (according to protocol)	No	Yes	Yes	Yes
5.7	Care of CVP lines	No	Yes	Yes	Yes
5.8	Pressure infusions	No	Yes	Yes	Yes
5.9	Infusion pumps	No	No	No	Yes
5.10	Blood pressure monitors	No	Yes	Yes	Yes
5.11	Pulse oxymeters	No	Yes	Yes	Yes

6- Wound Care		ECP-B	ECP-I	ECT	ECP-A
6.1	Wound cleansing	Yes	Yes	Yes	Yes
6.2	Wound dressing	Yes	Yes	Yes	Yes
6.3	Stabilization of impaled objects	Yes	Yes	Yes	Yes
6.4	Control of bleeding using:				
	6.4.1 Direct/indirect pressure	Yes	Yes	Yes	Yes
	6.4.2 Pressure dressing	Yes	Yes	Yes	Yes
	6.4.3 Elevation	Yes	Yes	Yes	Yes
	6.4.4 Pressure points	Yes	Yes	Yes	Yes
	6.4.5 PASG suit		Yes	Yes	Yes
	6.4.6 Use of tourniquet application for amputations only	Yes	Yes	Yes	Yes
	6.4.7 Cold compress	Yes	Yes	Yes	Yes
6.5	Care of burns	Yes	Yes	Yes	Yes
6.6	Care of eye injuries	Yes	Yes	Yes	Yes
6.7	Care of evisceration	Yes	Yes	Yes	Yes
6.8	Care of amputation wounds	Yes	Yes	Yes	Yes
6.9	Care of amputated parts of the body and transportation thereof	Yes	Yes	Yes	Yes
6.10	Gunshot injuries	Yes	Yes	Yes	Yes
6.11	Crush injuries	Yes	Yes	Yes	Yes

7- Spinal injuries		ECP-B	ECP-I	ECT	ECP-A
7.1	Assessment	Yes	Yes	Yes	Yes
7.2	Airway management	Yes	Yes	Yes	Yes
7.3	Immobilization of spine	Yes	Yes	Yes	Yes
7.4	Transportation of spinal injury patients	Yes	Yes	Yes	Yes
7.5	Application of cervical collar and cervical immobilization	Yes	Yes	Yes	Yes
7.6	Use of extrication and immobilization devices	Yes	Yes	Yes	Yes
7.7	Shock management with spinal injuries	Yes	Yes	Yes	Yes
7.8	Manual ventilation with spinal injuries	Yes	Yes	Yes	Yes
7.9	Temperature control with spinal injuries	Yes	Yes	Yes	Yes

8- Musculo-skeletal injuries		ECP-B	ECP-I	ECT	ECP-A
8.1	Applying traction to fractures	Yes	Yes	Yes	Yes
8.2	Padded boards splints	Yes	Yes	Yes	Yes
8.3	Traction splints	Yes	Yes	Yes	Yes
8.4	PASG suit	No	Yes	Yes	Yes
8.5	Realignment of displaced fractures	No	No	No	Yes
8.6	Assessment of distal neuro-vascular function	Yes	Yes	Yes	Yes
8.7	Sports injuries	Yes	Yes	Yes	Yes

9- Chest and abdominal injuries	ECP-B	ECP-I	ECT	ECP-A

9.1	Positioning of patient with chest injuries	Yes	Yes	Yes	Yes
9.2	Recognition of haemothorax/pneumothorax	Yes	Yes	Yes	Yes
9.3	Recognition of tension pneumothorax	Yes	Yes	Yes	Yes
9.4	Recognition and management of sucking chest wounds	Yes	Yes	Yes	Yes
9.5	Use of Heimlich-types valve/valved needle for tension pneumothorax decompression	No	Yes	Yes	Yes
9.6	Management of abdominal injuries	Yes	Yes	Yes	Yes
9.7	Use of PASG suit in abdominal injuries	No	No	No	Yes
9.8	IV fluids	No	Yes	Yes	Yes
9.9	Recognition of pericardial tamponade	Yes	Yes	Yes	Yes
9.10	Management of fractured ribs/sternum	Yes	Yes	Yes	Yes

10- Medical emergencies		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
10.1	Positioning and safeguarding of patient	Yes	Yes	Yes	Yes
10.2	Oxygen administration	Yes	Yes	Yes	Yes
10.3	IV cannulation	No	Yes	Yes	Yes
10.4	Drug administration (on medical protocol)	No	Yes	Yes	Yes
10.5	PSAG suit	No	Yes	Yes	Yes
10.6	Finger prick blood glucose analysis	Yes	Yes	Yes	Yes

10.7	Entonox self-administration by patient	Yes	Yes	Yes	Yes
10.8	Entonox operator administration	No	No	No	Yes
10.9	Preparation and attachment of ECG monitoring equipment	No	Yes	Yes	Yes
10.10	Transport of unconscious patient	Yes	Yes	Yes	Yes

11- Obstetrics		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
11.1	Normal delivery procedure	Yes	Yes	Yes	Yes
11.2	Malpresentation management	Yes	Yes	Yes	Yes
11.3	IV fluids for mother	No	Yes	Yes	Yes
11.4	PSAG suit (leg components only)	No	Yes	Yes	Yes
11.5	Oxygen administration	Yes	Yes	Yes	Yes
11.6	Pain relief (Entonox-patient self-administration)	Yes	Yes	Yes	Yes
11.7	Clamping and cutting umbilical cord	Yes	Yes	Yes	Yes
11.8	Resuscitation of neonate				
	11.8.1 Basic life support	Yes	Yes	Yes	Yes
	11.8.2 Advanced life support	No	No	No	Yes
11.9	Ante-natal external examination	Yes	Yes	Yes	Yes
11.10	Post-natal external examination	Yes	Yes	Yes	Yes
11.11	Management of post-natal	Yes	Yes	Yes	Yes

	complications				
11.12	Delivery of placenta	Yes	Yes	Yes	Yes
11.13	Administration of IV drugs (on medical protocol)	No	Yes	Yes	Yes
11.14	Management of prolapsed cord	Yes	Yes	Yes	Yes
11.15	Transportation of mother and child	Yes	Yes	Yes	Yes

12- Poisons, bites and stings		ECP-B	ECP-I	ECT	ECP-A
12.1	Management of bites: 2, 4, 6 and 8 legged	Yes	Yes	Yes	Yes
12.2	Management of snake bites	Yes	Yes	Yes	Yes
12.3	Administration of oxygen	Yes	Yes	Yes	Yes
12.4	IV fluids	No	Yes	Yes	Yes
12.5	IV drug therapy (on medical protocol)	No	Yes	Yes	Yes
12.6	Management of stings	Yes	Yes	Yes	Yes
12.7	Management of drug overdose	Yes	Yes	Yes	Yes
12.8	Management of anaphylactic shock	Yes	Yes	Yes	Yes

13- Paediatric emergencies		ECP-B	ECP-I	ECT	ECP-A
13.1	Airway management in children and neonates	Yes	Yes	Yes	Yes
13.2	IV fluids in children and infants	No	Yes	Yes	Yes
13.3	IV drugs administration in children and infants (on medical protocol)	No	No	No	Yes
13.4	Approach to psychological	Yes	Yes	Yes	Yes

	emergencies				
13.5	Oxygen administration	Yes	Yes	Yes	Yes
13.6	PASG suit in children	No	No	No	Yes
13.7	Endotracheal intubation	No	No	No	Yes
13.8	Nasogastric tube insertion	No	No	No	Yes
13.9	Incubator transport and management	No	Yes	Yes	Yes
13.10	CPR in children and infants				
	13.10.1 Basic life support 13.10.2 Advanced life support	Yes No	Yes No	Yes No	Yes Yes
	13.10.3 Defibrillation	No	No	No	Yes

14- Lifting and carrying of patients and carrying devices		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
14.1	Lifting patient from bed to stretcher	Yes	Yes	Yes	Yes
14.2	Wheeled stretchers	Yes	Yes	Yes	Yes
14.3	Rescue stretchers	Yes	Yes	Yes	Yes
14.4	Stair chair stretcher	Yes	Yes	Yes	Yes
14.5	Lifting patient from floor to stretcher	Yes	Yes	Yes	Yes
14.6	Emergency lifting and carrying techniques	Yes	Yes	Yes	Yes

15- Water rescue		**ECP-B**	**ECP-I**	**ECT**	**ECP-A**
15.1	Resuscitation of the near-drowned	Yes	Yes	Yes	Yes

16- Vehicle rescue (also as part of Medical Rescue Course)		ECP-B	ECP-I	ECT	ECP-A
16.1	Safety of scene	Yes	Yes	Yes	Yes
16.2	Use of extrication and immobilization equipment	Yes	Yes	Yes	Yes
16.3	Introduction to medical rescue equipment	Yes	Yes	Yes	Yes
16.4	HAZMAT evaluation	Yes	Yes	Yes	Yes

17-Radio communication		ECP-B	ECP-I	ECT	ECP-A
17.1	Procedures	Yes	Yes	Yes	Yes

18- Physically and mentally handicapped		ECP-B	ECP-I	ECT	ECP-A
18.1	Recognition of the handicapped	Yes	Yes	Yes	Yes
18.2	Communication with handicapped	Yes	Yes	Yes	Yes
18.3	Transportation of the handicapped	Yes	Yes	Yes	Yes

19- Aircraft evacuation		ECP-B	ECP-I	ECT	ECP-A
19.1	Preparation of terrain for helicopter landing	No	Yes	Yes	Yes
19.2	Approaching the helicopter	No	Yes	Yes	Yes
19.3	Loading of patient into the helicopter	No	Yes	Yes	Yes
19.4	Approaching fixed wing aircraft	No	Yes	Yes	Yes
19.5	Loading of patient onto fixed wing aircraft	No	Yes	Yes	Yes

20- Environmental emergencies		ECP-B	ECP-I	ECT	ECP-A
20.1	Hyperthermia				
	20.1.1 Management of heat cramps, heat exhaustion and heat stroke	Yes	Yes	Yes	Yes
	20.1.2 Physical cooling of patient	Yes	Yes	Yes	Yes
	20.1.3 IV fluid rehydration	No	Yes	Yes	Yes
	20.1.4 Oral rehydration	No	Yes	Yes	Yes
	20.1.5 Blood glucose management	No	Yes	Yes	Yes
20.2	Hypothermia				
	20.2.1 Management of stages and types	Yes	Yes	Yes	Yes
	20.2.2 Warming of patient	Yes	Yes	Yes	Yes
20.3	Shark attack				
	20.3.1 On-scene management and transportation	Yes	Yes	Yes	Yes
20.4	Management of diving accidents	Yes	Yes	Yes	Yes
20.5	Infection control	Yes	Yes	Yes	Yes
20.6	Communicable disease	Yes	Yes	Yes	Yes
20.7	Disaster management and triage	Yes	Yes	Yes	Yes
20.8	Legal requirements	Yes	Yes	Yes	Yes
20.9	Management of electrocution	Yes	Yes	Yes	Yes
20.10	Management of radiation exposure	Yes	Yes	Yes	Yes

Annexure B: Basic equipment

This information was obtained from the Health Professional Council of South Africa.

Description	Basic Life Support ambulance		Intermediate Life Support ambulance		Advanced Life Support ambulance		Response vehicle Advanced Life Support ambulance	
Airway and Breathing	Minimum	Recommended	Minimum	Recommended	Minimum	Recommended	Minimum	Recommended
Oxygen delivery device (portable or fixed) capable of 15 L/min x 30 minute.	1	2	1	2	1	2	0	0
Oxygen delivery device portable capable of 15 L/min x 15 minutes	1	2	1	2	1	2	1	1
Bag valve mask resuscitator (adult)	1	1	1	1	1	1	1	1
Bag valve mask resuscitator (Paediatric)	1	1	1	1	1	1	1	1
Suction device (manual or battery)	1	1	1	1	1	1	1	1
Laryngoscope with blades	0	0	0	0	1	1	1	1
Magill Forceps (adult)	0	0	1	1	1	1	1	1
Magill Forceps (Paediatric)	0	0	1	1	1	1	1	1
Cricothirodotomy set	0	0	0	0	1	1	1	1
Oxygen mask (minimum 40%)	4	6	4	6	4	6	4	4
Nebulizer mask	4	6	4	6	4	6	4	4
Nebulizer T piece	0	0	0	0	1	1	1	1
Endotracheal tubes 3.0 mm	0	0	0	0	3	3	3	3
Endotracheal tubes 5.0 mm	0	0	0	0	3	3	3	3
Endotracheal tubes 7.0 mm	0	0	0	0	3	3	3	3
Endotracheal tubes 8.0 mm	0	0	0	0	0	3	0	3

ET stylet / Introducers	0	0	0	0	1	3	1	3
ET tube fixation tape or device	0	0	0	0	3	6	3	6
Oropharyngeal airways 1	2	4	2	4	2	4	2	4
Oropharyngeal airways 2	2	4	2	4	2	4	2	4
Oropharyngeal airways 3	2	4	2	4	2	4	2	4
Oropharyngeal airways 4	2	4	2	4	2	4	2	4
Suction catheter FG 5 – 10	2	4	2	4	2	4	2	4
Suction catheter FG 12 – 16	2	4	2	4	2	4	2	4
Yankauer suction catheter	2	4	2	4	2	4	2	4

Description	Basic Life Support ambulance		Intermediate Life Support ambulance		Advanced Life Support ambulance		Response vehicle	
Circulation	Minimum	Recommended	Minimum	Recommended	Minimum	Recommended	Minimum	Recommended
ECG electrodes	0	0	6	30	6	30	6	30
Pacing pads	0	0	0	0	1	2	1	2
Defibrillation gel	0	0	1	1	1	1	1	1
Ringers lactate 1000 ml	0	0	4	6	4	6	4	6
Sodium chloride 0.9% 200 ml	1	1	4	4	4	6	4	6
Synthetic colloid solution (eg haemaccel)	0	0	2	3	2	4	2	4
10 drop/ml IV administration set	0	0	4	6	4	6	4	6
60 drop/ml IV administration set	0	0	4	4	4	6	4	6
15 or 20 drop/ml IV administration set	0	0	1	2	2	4	2	4
5 ml syringe	2	2	2	2	3	6	3	6
20 ml syringe	0	0	3	4	3	6	3	6
50 ml syringe	0	0	0	0	1	4	1	4
21 G injection needle	2	2	2	2	6	6	6	6
18 G injection needle	0	0	0	0	6	6	6	6
14 G IV cannulas	0	0	4	6	4	6	4	6
16 G IV cannulas	0	0	4	6	4	6	4	6
18 G IV cannulas	0	0	4	6	4	6	4	6
20 G IV cannulas	0	0	4	6	4	6	4	6
22 G IV cannulas	0	0	4	6	4	6	4	6
Transparent adhesive dressing for IV site	0	0	4	6	4	6	4	6
Monitoring, Defibrillation and instruments								
Glucometer	0	1	0	1	0	1	0	1
Blood glucose testing strips	1	1	1	1	1	1	1	1

Stethoscope	1	1	1	1	1	1	1	1
Artery forceps	0	0	0	0	1	1	1	1
Scissors	1	1	1	1	1	1	1	1
Sphygmomanometer	1	1	1	1	1	1	1	1
ECG monitor & defibrillator	0	0	1	1	1	1	1	1
External cardiac pacemaker	0	0	0	0	1	1	1	1
Pulse oximeter	0	0	1	1	1	1	1	1
Scalpel blades	0	0	0	0	1	2	1	2
Pupil torch	1	1	1	1	1	1	1	1
Clinical thermometer	1	1	1	1	1	1	1	1

Description	**Basic Life Support ambulance**		**Intermediate Life Support ambulance**		**Advanced Life Support ambulance**		**Response vehicle**	
Medication	**Minimum**	**Recommended**	**Minimum**	**Recommended**	**Minimum**	**Recommended**	**Minimum**	**Recommended**
Adenosine	0	0	0	0	0	5	0	5
Adrenaline (1 mg)	0	0	0	0	10	50	10	50
Amiodorone (150 mg/5 ml)	0	0	0	0	3	5	3	5
Aspirin (300 mg)	0	0	6	6	12	24	12	24
Atropine (1 mg)	0	0	0	0	5	20	5	20
Beta 2 stimulant nebulizing solution	4	4	4	4	3	10	3	10
Calcium Gluconate (or Chloride) 10%/10ml	0	0	0	0	5	5	5	5
Dextrose 50%/20 ml	0	0	3	5	5	10	5	10
Diazepam (10 mg)	0	0	0	0	0	2	0	2
Flumazenil (0.5 mg)	0	0	0	0	0	2	0	2
Glucose powder or gel	1	1	0	1	0	1	0	1
Hydrocortisone	0	0	0	0	2	5	2	5
Ipratropium bromide nebulizing solution	0	0	0	0	3	10	3	10

Lasix (20 mg/2 ml)	0	0	0	0	5	10	5	10
Lignocaine 2% (5 ml) IV	0	0	0	0	5	10	5	10
Midazolam (15 mg/3 ml)	0	0	0	0	5	5	5	5
Morphine (15 mg/ml)	0	0	0	0	5	5	5	5
Naloxone	0	0	0	0	4	6	4	6
Nitroglycerine tablets or spray	0	0	0	0	1	1	1	1
Sodium bicarbonate (8.5%/50 ml)	0	0	0	0	2	6	2	6
Water for injection (10 ml)	0	0	0	0	0	10	0	10
Infection Control								
Gloves, examination, unsterile	10	10	10	10	10	10	10	10
Gloves sterile assorted	0	0	0	0	2	5	2	2
Antiseptic solution	0	1	0	1	1	0	1	0
Alcohol swabs	10	10	10	10	10	10	10	10
Sterile water pour	0	2	0	2	0	2	0	2
Medical waste box	1	1	1	1	1	1	1	1
Face masks	4	4	4	4	4	4	4	4
Goggles	2	2	2	2	2	2	2	2
Sharps container	1	1	1	1	1	1	1	1

Description	Basic Life Support ambulance		Intermediate Life Support ambulance		Advanced Life Support ambulance		Response vehicle	
Wound dressing & immobilization	**Minimum**	**Recommended**	**Minimum**	**Recommended**	**Minimum**	**Recommended**	**Minimum**	**Recommended**
Triangular bandages	2	12	2	12	2	12	2	12
Adhesive bandage 75 – 100 mm	1	1	1	1	1	1	1	1
Conforming bandages 50 mm	6	6	6	6	6	6	6	6
Conforming bandages 75-100 mm	6	6	6	6	6	6	6	6
Conforming bandages 150 mm	2	2	2	2	2	2	2	2
Gauze swabs 100x100 mm	10	100	10	100	10	100	10	100
Sanitary towels	4	4	4	4	4	4	4	4
Upper extremity splint	2	4	2	4	2	4	2	4
Lower extremity splint	2	4	2	4	2	4	2	4
Lower extremity traction splint	1	2	1	2	1	2	1	2
Cervical collar (adjustable/ set of sizes)	2	4	2	4	2	4	2	4
Spine board	1	2	1	2	1	1	0	0
Head immobilization device	1	2	1	2	2	2	0	0
Spider harness or set of straps	1	2	1	2	2	2	0	0
KY sachet/tube	1	2	1	2	4	6	4	6
Others								
Linen savers	4	6	4	6	4	6	0	0
Blanket or space blanket	2	4	2	4	2	4	2	2
Linen sheets	4	6	4	6	4	6	0	0
Patient report forms	1	1	1	1	1	1	1	1
Traffic cones	6	6	6	6	6	6	6	6
Fire extinguisher	1	2	1	2	1	2	1	2
Torch	1	2	1	2	1	2	1	1
Reflective jackets or bibs	2	2	2	2	2	2	2	2

Ambulance stretcher (trolley type)	1	2	1	2	1	2	0	0
Scoop tyre stretcher	0	1	0	1	0	1	0	1
NG Tube	0	0	0	0	2	4	2	4
Urine bag	0	0	0	0	2	4	2	4
Burn shield pack	1	1	1	1	1	1	1	

*

Annexure C: Weekly equipment checklist

Month: _____ Shift: | 1 | 2 | 3 | 4 |

Vehicle registration: _____

Key: | N | = None | D | = Damaged | F | = Faulty | ✔ | = Correct |

Date														
	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
Day	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Mast Suit														
Bag Valve Mask														
Suction														
Kidney Bowl														
Urinal														
Bed Pan														
0,74 kg O_2														
1,89 kg O_2														
0,79 kg Entonox														
O_2 Gauges														
Flow Meters														
Half Spine														
Full Spine														
Spider Harness														
Scoop														
Kendrich Extrication Device														
Traction Splint														
Medi- Splints –Arm														
Medi- Splints –Leg														

Kramer Wire Splints –Arm														
Kramer Wire Splints –Leg														
Ferno Head Blocks														
O_2 Mask-Paediatric														
O_2 Mask-Adults														
O_2 Mask-Nebulization														
Cervical Collars-SML														
Traffic Cones														
Blankets & Sheets														
SIGNATURE														
Signature: SHIFT Senior														

Annexure D: Training of staff

This document discusses how staff will be trained in the province as well as the selection criteria of staff to be trained. It also looks at the retention of staff after training.

At present the provincial training college is accredited to present the Emergency Care Technician (ECT) course, 12 rescue modules, refresher training, Continuous Professional Development (CPD) and control room training. The college also presents driver training. Based on the research done the college will also start an induction course to inform staff of the non-medical areas of Emergency Medical Services.

1. EMERGENCY CARE TECHNICIAN

1.1 Selection for this course will be done as per the National Department of Health regulations.

1.2 Applicants must complete the application form. Both the station officer and district manager must sign the application form to grant applicants permission to go on the course.

1.3 Applicants will be invited for a numeracy and literacy test and a physical evaluation.

1.4 The top applicants from the numeracy and literacy test who passed the physical selection will be selected for the course by the Emergency Medical Services Training College.

1.5 Staff members who are in the employ of the Department will be given preference over school leavers.

1.6 Only candidates who are resident in the North West Province will be considered.

1.7 School leavers who complete the course will be absorbed into the service.

2. RESCUE MODULES

2.1 Selection for the rescue modules will be done as per the University of Johannesburg regulations.

2.2 Applicants must complete the application form. Both the station officer and district manager must sign the application form to grant applicants permission to go on the first rescue module (High Angle 1).

2.3 Applicants will be invited for a knot and physical examination.

2.4 The top applicants from the physical examination who passed the knot examination will be selected for the High Angle 1 course by the Emergency Medical Services Training College.

2.5 Candidates will be selected for the other modules (2-12) on grounds of their performance (theory) of the previous modules.

2.6 Staff members will be selected based on the needs per their station.

2.7 Stations that have too many staff members with a certain qualification will be moved to the back of the line in terms of selection.

3. REFRESHER, CONTROL ROOM AND DRIVER TRAINING

3.1 A year programme will be distributed by the College at the beginning of each financial year.

3.2 Each district will be allocated an equal amount of space on the courses.

3.3 Districts will nominate learners that they want to send on courses depending on their need.

3.4 The Emergency Medical Services Training College will accept any learners who are sent by the districts.

3.5 Each district will be given a template to complete to register their training needs.

4. CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

4.1 To be able to register with the HPCSA staff needs to collect Continuous Professional Development points.

4.2 The college will send out a Continuous Professional Development questionnaire once a month.

4.3 Any staff member can complete the questionnaire, which needs to be returned to the college before the closing date.

4.4 Members who receive more than 70% for the questionnaire will receive Continuous Professional Development points.

4.5 Continuous Professional Development lectures are also held on the first Thursday of the month at 14:00 at the college.

4.6 Emergency Medical Services Training college staff attending this lecture will also receive Continuous Professional Development points.

4.7 Continuous Professional Development sessions will also be held once a month in each of the districts. This will be done on the third week of the month.

4.8 Continuous Professional Development sessions will comprise both medical and non-medical training.

4.9 There will be a strong focus on ethics.

4.10 Non-training college staff members will be encouraged to be present at the session.

4.11 All coordination of the sessions will be done by the Emergency Medical Services Training College.

5. NON-MEDICAL EMERGENCY MEDICAL SERVICES TRAINING

5.1 Non-medical training will focus on all areas of Emergency Medical Services that are not related to the medical course.

5.2 These will focus, but not exclusively, on:

a) Response time identification;

b) Staff discipline;

c) Ethics training;

d) Understanding of warning devices and the Road Traffic Act;

e) Patient care in relation to bedside manner (Batho Pele);

f) Understanding of the service delivery environment;

g) Labour relations in the Public Service; and

h) Use of technology within Emergency Medical Services.

5.3 All the course material for the modules will be developed by the Emergency Medical Services Training College.

5.4 This training will be compulsory for all Emergency Medical Care Practitioners.

6. OTHER TRAINING

6.1 Specialized courses can be presented as the need arises.

6.2 Districts can contact the college with any special requests.

7. RETENTION OF EMERGENCY MEDICAL SERVICES STAFF AFTER TRAINING

7.1 In order to ensure that Emergency Medical Services do not lose scarce resources, by training and subsequently losing personnel, and to ensure that the personnel that are trained in the North West Province benefit the population of this province.

7.2 It is, therefore, imperative that Emergency Medical Services, put policies into place which will safeguard scarce financial resources and at the same time benefit the people of the province.

7.3 It is proposed that before a staff member goes on a course, he should sign a contract.

7.4 This contract will bind the staff member to work for a specified period of time after the completion of the course.

7.5 The following table specifies the proposed minimum period that the student will be required to work for the department on completion of the course:

7.5.1 MEDICAL COURSE

COURSE	DURATION	CONTRACT
Bachelor of Technology: Ambulance and Emergency Care	4 years	48 months
Emergency Care Technician	2 years	24 months

7.5.2 RESCUE COURSE

COURSE	DURATION	CONTRACT
Module 1- 3	6 weeks	6 months
Module 4 - 8	10 weeks	12 months
Module 9 -12	8 weeks	18 months

7.5.3 ADMINISTRATIVE

7.5.3.1 The staff member who is sent on an administrative course will have to work, on completion of such course, for a minimum period equivalent to the duration of the course, e.g. attending a 6 month- course will mean working for a period of at least 6 months on completion.

8. RENEGING ON THE CONTRACT

8.1 Should the staff member renege on the contract, he/she will pay back the full amount of the course before being released from the contract.

8.2 The only exceptions will be death or medical unfitness of the staff member, rendering him/her unable to continue with his/her functions.

8.3 If a staff member wishes to resign, a portion of the funds can be calculated for the staff member to pay.

8.4 This will have to be a negotiated agreement.

ANNEXURE E: SCIENTIFIC VEHICLE ALLOCATION

This should be utilized in cases of limited resources to adequately allocate vehicles.

The number of vehicles allocated per station at present does not have any scientific basis and thus it was necessary to have a scientific basis to determine vehicle allocation.

The number of vehicles required is in excess of the actual number of vehicles that is available or can be procured. In addition, the number of vehicles that can be utilized is reliant on the number of staff. Thus a balance needs to be found on how to allocate vehicles.

1. SCIENTIFIC DATA FOR EMERGENCY MEDICAL SERVICES VEHICLE DATA ALLOCATION

At present the categories of stations are not based on any scientific data. An example is that Mahikeng does about 900 calls in a month and Vryburg does about 400 calls per month, but they are the same category of station. The population density of Mahikeng is greater than that of Vryburg. Thus it is necessary to create a scientific model. This model will help with restructuring and development.

The information required is the following:

a) Monthly station statistics;
b) Population density;
c) Mileage travelled; and
d) Area covered (square metres).

2. PART A

The monthly statistics are divided by 30 to get the calls done per day. This figure is then divided by 24 to give the number of calls done per hour. This will give the actual number of ambulances needed per hour.

The mileage travelled is divided by the monthly station statistics to give the average mileage per patient. This gives an indication of how long an ambulance is busy with one patient.
To get the number of ambulances needed the average mileage constant is based on the following table:

AVERAGE MILEAGE	CONSTANT
0-50KM	1
50-100 KM	1.5
MORE THAN 100 KM	2

This constant is based on the time it will take for an ambulance to complete a call. For example, if an ambulance has to travel between 50 to 100 kilometres it will take approximately one and a half hours to complete the call. Thus the constant is 1.5.

The constant is then multiplied by the number of calls per hour and this should give the number of vehicles needed per hour for the particular station. This is the suggested vehicle complement for that particular station. This model is based on human error as both the monthly statistics as well as mileage travelled can be inflated. The model used to collect the data determines this. At present there is no uniform model.

3. PART B

The population density divided by the area covered determines a rural index. The following table indicates the number of vehicles required per population based on how rural the area is.

RURAL INDEX	VEHICLE PER POPULATION
0-15	30 000
15-30	40 000
30 and above	50 000

This index takes into account travelling times as well as road surface conditions.

The number of ambulances is thus determined by the population divided by the number of vehicles per population as per the rural index.

4. PART C

To find the average, the figure from both part A and part B must be utilized. Because the accuracy of the statistics in part A is subjective one has to rely more heavily on part B, thus the following equation is utilized.

Part A added to two times part B. This figure is then divided by 3.

This will then provide the figure for the number of ambulances for an area.

This data then forms a scientific basis for how the vehicles are distributed in the province. It is important to realize that the more accurate the information the more accurate the resultant answer will be.