

## The St John Ambulance Service in Port Moresby: a ten-year review, 1984-1993

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### SUMMARY

The National Capital District (NCD) is unique within Papua New Guinea in having a professional ambulance service which provides emergency care during transfer to hospital. This service has been run by St John Ambulance, who have maintained records of their work during their first ten years of operation. To review the operation of the service and to consider its potential for other parts of Papua New Guinea these records were transferred to a database and analyzed. The results of this analysis, together with relevant background, are presented and some of the issues which emerge are discussed. There have been heavy demands on the ambulance service to provide a taxi service for transferring patients between health facilities. Cancelled calls have also been a heavy drain on the service. Pregnancy-related requests for transport, including home deliveries, constitute the major group of emergency calls. Requests for transfer of patients with an acute medical or surgical condition requiring skilled attention provide an important part of the nonobstetrical work of the service, though this group makes up only 10% of the total number of requests. Trauma contributed 26% of the nonobstetrical emergency work of the service. The rate of requests for the population of the NCD has decreased and it is suggested that this is due to greater access to private vehicles rather than a decrease in demand for emergency transport. It is apparent that a skilled ambulance service cannot be provided cheaply, although for 1993 at 15 kina per request, or 30 kina if only the emergency requests are considered, the service is clearly efficient. Providing a similar service to other parts of Papua New Guinea with lower population densities and less sealed road would be very much more expensive. It is unlikely that the health services could approximate a similar degree of cost-efficiency to that of St John.

### Introduction

Papua New Guinea is among 47 countries where the St John Ambulance Service operates. The first ten years of service by the St John Ambulance Service to the people of the National Capital District (NCD) was completed at the end of 1993.

The Port Moresby St John Ambulance is a branch of The Order of St John. The Order includes the St John Association for the Blind, the Training Branch, which promotes training in first aid, and the Operations Branch, whose members undertake voluntary work. There was a small but active ambulance service in the North

Solomons Province before the troubles there but there are no others in Papua New Guinea.

Responsibility for the ambulance service was transferred to St John from the Health Department in January 1984. During the ten years of operating the service the population of the National Capital District has grown by over 50% to over 193 000, as estimated by the National Statistical Office in 1994 based on the 1990 census.

The ambulance service is operated in the National Capital District although no funding is currently received from the National Capital District Commission; there is no other

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ambulance service in the district. St John do not ask for a fee for the service they provide except for transport outside of the boundaries of the NCD, for use by private patients or for transfers to and from the airport. Unlike in many other countries the phone number used to request an ambulance is not easily remembered (currently 3256822) although it is listed inside the cover of the telephone book.

The total operating cost for the service in 1993 was K274 000. Salaries form 60% of the costs, which is similar to other health service delivery operations. In addition there are many essential expenses that may be forgotten in the planning of an ambulance service such as K20 000 for fuel and oil, K6000 for insurances and K9000 for phone rental and calls. To cover these costs the service received a grant of K214 000 in 1993 from the Department of Health and K12 000 from private donations or from sporting bodies. Fees brought in a further K6000, most of which were charged for the transport of deceased persons. In 1993 the average cost per request was K15, or K30 if only the emergency requests are considered.

Each ambulance is equipped with ambu bags, oxygen bottles, nebulisers, lifting frames and splints. Accordingly the ambulance crew are all conversant with how to give emergency first aid and to transport a patient safely.

Apart from emergency transfers, transport for patients referred to Port Moresby General Hospital (PMGH) from the urban clinics within NCD has been provided. Ambulances have also been used, under contract, to provide transport internally on the site of the general hospital.

The service employs 25 full-time staff under the general management of an Executive Officer; volunteers work with professional staff during weekends. First aiders offering a service attending sports functions are members of the St John Operations Branch and not the ambulance service. The sports attended have been extended during recent years to include hockey and soccer in addition to rugby league and rugby union.

The busy days of the week for the ambulance crews are reported to be over the weekends especially on pay fortnights, although the place of alcohol usage in determining service use is unknown.

## Methods

All calls for an ambulance are logged on daily activity sheets which are summarized at the end of the month. These figures do not distinguish between sex or age but register an entry under the type or source of request, or the medical problem leading to the request. Only one entry per request is entered on to the record sheets so that a case of unconsciousness is not also recorded as a transfer from an NCD clinic to hospital. As the records were transcribed from monthly summary sheets we cannot analyze the data in terms of the case-mix for the types of transfer.

The monthly reports for the ten years 1984 to 1993 inclusive were entered on to a database file in dBase 3 (Ashton Tate). Data for a six-month period from July 1987 until January 1988 were unfortunately missing, which gave a total of 114 months for analysis. These data were then checked against the original reports before reading the file into Epi-Info 3 for analysis. After simple frequencies had been derived, the regression function of Epi-Info was used to derive regression lines to indicate trends over the ten years.

## Results

The total number of requests for ambulances during the ten years was 181 534, which is an average number of 1592 per month. The reasons for these requests are shown in Table 1. The data for the last six months of 1987 are missing so that the figures are under-recordings for the ten years by approximately 5%. This will not affect the mean number of requests per month which have been calculated on the actual number of months for which data were available.

Of all the requests nearly 53 000 (29%) were requests for transport between different sections of Port Moresby General Hospital; since 1994 this service has been performed entirely by the hospital. In addition, the ambulance service provided over 18 000 transfers during the ten years for patients between the urban clinics of NCD and PMGH.

The number of requests (less cancellations, transfers from NCD clinics and internal requests from PMGH) has stayed at a similar figure over the ten years. For the first four

**TABLE 1**

## REASONS FOR AMBULANCE REQUESTS

Reason for request	Total No (1984-1993)	Estimated No/month*
Total requests	181534	1592
Internal hospital transfers	52978	465
Pregnancy or in labour (born before arrival in hospital)	23618 (2681)	207 (24)
Cancellations	23042	202
Transfers from NCD clinics	18002	158
Deliberate violence (assault)	7795	68
Abdominal pain	6649	58
Diarrhoea	3872	34
Trauma of indeterminate cause	3146	28
Chest pain or suspected MI	2223	20
Motor vehicle accident (and DOA)	2209	19
Cough	1486	13
Seizures	812	7
Sports injuries	746	7
Acute psychiatric conditions	455	4
Snake bite	399	4
Burns	286	3
Unconsciousness	248	2
Industrial accidents	119	1
Other emergency reasons**	1115	10
Other requests	32334	284

\*The total number of months in the study was 114 (120 less 6, the period for which there was a gap in the records)

MI myocardial infarction

DOA dead on arrival

\*\* Other emergency reasons include drowning (62), accidental overdose (265), poisoning (115), suicide (70) and attempted suicide (603)

The total number of emergency requests was estimated as 73640

months after St John assumed responsibility for the service in 1984 there was an excess of 100-200 calls per month over the following months, which rapidly stabilized to a mean of 770 emergency requests per month or 26 per day.

Some calls from the general public did not end in a patient transfer due to a variety of reasons. Sometimes, after assessment by the ambulance officer, the patient would not be considered to require transfer to hospital, on

other occasions the location of the house could not be found, or the patient refused to be moved. These are grouped as cancellations and were the outcome of 13% of all requests.

Requests for transfer of women in labour amounted to 27% of actual transfers (not including transfers within or between health facilities or cancellations). 11% of these women actually had the delivery supervised by ambulance officers in their own homes or during transit to hospital. The requests for transfer of women in labour have remained at a similar level during the ten years despite the number of women delivering in Port Moresby General Hospital having increased by 50% to 10 000 deliveries per year in 1993 (Dr G. Mola, personal communication).

Trauma (13 150 requests) contributed 26% of the nonobstetrical emergency work of the service. Requests to transfer victims of motor vehicle accidents amounted to 17% of all trauma requests (less than 3% of the total emergency requests). Burns were unusual with only 3 requests per month. Chest pain and suspected myocardial infarction contributed a similar number of requests as motor vehicle accidents.

Transport of victims of motor vehicle accidents has decreased during the decade although the number of reported motor vehicle accidents has increased over the years for which records have been available. Private vehicle registrations in the NCD have been estimated to have increased by 50% in the last six years to nearly 11 000 in 1993 (Department of Transport data). During 1993 the ambulance service transported 212 patients including 10 deaths. The transport request rate in 1993 was 46 per 1000 population compared to 72 per 1000 in 1985 (the second year of St John providing the service).

Transfers for fighting have risen by 25% since 1984 to an average of two cases per day, but within this figure is a doubling of the number of cases of stabbing during the ten years. This latter group includes deliberate injuries from screwdrivers and other penetrating instruments as well as lacerations from bushknives. Although fractures and dislocations have shown no trends, gunshot wounds have increased slightly while arrow wounds have decreased.

Abdominal pain and diarrhoea together constitute a significant group of requests with over 14% of all emergency calls. Sports injuries have risen during the ten years of the service although this is partly due to greater staffing by the St John Operations Branch at sports venues.

Industrial accidents, never a major source for requests, have remained on average one request per month. Acute psychiatric conditions, despite industrialization in the NCD, have been the source of far more requests.

The introduction of nebulisers which ambulance crews are trained to use in a patient's home has reduced the number of patients transported to hospital with acute dyspnoea. Patients who fail to improve with the use of the nebuliser in the home are taken to the Emergency Department of PMGH using the nebuliser in transit.

Snake bites have decreased as a reason for transfer from a peak of 10 patients a month in 1986 to 3 per month in 1993. This is concurrent with increasing urbanization in the district.

## Discussion

An ambulance service is a valuable adjunct to emergency care but it will be noted that acute medical and surgical emergencies form only a small part of the work. All countries with ambulance services have conflicts between the relatively occasional emergency request and the major part of the workload which is the transport of patients not in an emergency condition. Many of these patients have no impediment to taking public transport since they suffer from complaints such as toothache, infected ears, sexually transmitted diseases and even constipation (12 cases in 1993). If a fee for service was charged on all requests it would be expected that some of these trivial requests would decrease.

The ability to summon an ambulance is dependent on access to telephones, which will remain a luxury convenience for most Papua New Guineans even in the urban areas for many years. In 1993 half of the phones in the country were located in the National Capital District, of which one-third were private

subscribers who are likely to have phones accessible outside of working hours (Posts and Telecommunications data). During the last few years there has been a growth rate of 10% in the number of phones so that accessibility to summon an ambulance should be increasing. However, there will be less of a role for an ambulance service in other parts of Papua New Guinea where phones are less accessible. Paradoxically, in view of the increasing number of motor vehicle accidents, the rise in the number of vehicles has had a beneficial effect on the ambulance service. The rise is likely to have contributed to more patients using their own, their neighbour's or other family member's transport to hospital. This effect has been at least partly responsible for keeping the number of requests steady against the rise in the population served.

This relative decrease in the number of calls per population is welcomed by the service as it is felt that it has been abused in the past by requests for trivial reasons. There is also a suggestion that the ambulance controllers' self-confidence in their ability to discriminate between urgent and trivial requests has increased. Anecdotally, patients have been known to request an ambulance to be taken to hospital on the assumption that they are more likely then to be examined by a doctor.

As the number of calls decrease there is an opportunity to improve the quality of care. One aspect is decreasing the response times to emergencies through standardization of radio frequencies available only to the emergency services. The network for police, fire service, ambulance use and possibly other organizations such as civil aviation could reasonably have at least one common frequency. A more easily remembered telephone number, similar to the triple 0 used for police in NCD, may also help.

The limitations to the information provided by this study are apparent when we consider the extra information that might have been useful during this review. For example, the age of patients transferred with diarrhoea with a view to exploring the emergency use of oral rehydration solutions would have been useful. The outcome of patients with abdominal pain is another group. It would be possible and useful to review these and other specific

aspects of the service through occasional audits rather than make the data collection system more complicated.

One important subgroup of fracture/dislocations are spinal injuries, which have remained constant. Rugby league has been a major source of this type of injury and its welcome decrease may reflect greater awareness by participants and tighter control of games.

As on average 24 women have had their children delivered by ambulance officers every month there is in effect a de facto home delivery service already in existence. This is a major reason for employing female ambulance officers although male officers are also trained in managing an uncomplicated childbirth. The service would like to employ more female officers but the current problems with crime and frequently strained relations with husbands make this difficult. A case can be made for officers to be supplied with ergometrine and be trained to give it after delivery of the child in order to reduce postpartum blood loss. It might even be considered reasonable to allow the patient who has just had a normal delivery to stay at home with a view to a visit from a midwife.

The transport of patients with seizures and unconsciousness is an important group who require skilled attention and justify the training and special facilities available in an ambulance. When we group patients who would benefit from skilled first aid and attention to airway management (i.e. trauma, chest pain, seizures, unconsciousness, snake bite, industrial and sports injuries) we have 35% of the nonobstetrical causes for emergency requests. It is really for this small group of just 10% of the total number of requests that the service was envisaged to operate. Without the special training and facilities available on ambulances for this relatively small part of the total workload many of these patients may have died.

The altruism of the service is not always reciprocated by the community. Equipment is sometimes stolen at the site of collection of a patient. The rise in requests for the transfer of victims of violence exposes officers to threats from the victim's opponents which may be a cause for concern in the future.

Ambulance officers work as a team, both members of which can drive or give skilled attention to a patient; the service does not operate on the basis of one driver and one medic. This is an important factor which differentiates St John from what is available in the provinces through the Department of Health. An ambulance service requires a major commitment in terms of training and resources; it is not bought cheaply. It is an anomaly that the funding for the service comes from the Department of Health, and that the National Capital District Commission makes no regular contribution.

Geographical factors may inhibit the development of a service in other parts of Papua New Guinea, e.g. Rabaul or Lae, where it may be necessary to have teams located in different places to be able to attend a patient within reasonable travelling time. Health Department 'ambulances' currently have to perform a variety of other duties and are

unlikely ever to be dedicated only for patient transport.

### **Conclusion**

We suggest that the ambulance service run by St John could provide a model for provision of similar services in other urban areas of Papua New Guinea. Such services, however, should not be considered superficially and require a guaranteed commitment of funds, the majority of which should come from the local authority.

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