Life Support Transportation Services 1979 Annual Report

Minnesota Department of Health
Emergency Medical Services Section
717 Delaware Street S.E.
Minneapolis, Minnesota 55440

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Prepared by the Emergency Medical Services Section
and the Minnesota Center for Health Statistics
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INTRODUCTION

The purpose of this report is to describe the status of emergency medical services (EMS) provided by life support transportation services in Minnesota. The tables and figures presented in this report represent calendar year 1979 data.

The data were drawn from ambulance trip forms (Appendix A) submitted to the Minnesota Department of Health (MDH) and are restricted to those runs in which an ambulance was responding to a medical emergency. Of the 69,263 trip forms submitted to the MDH, 56,437 (81%) contained what appeared to be complete and accurate information and were included in the analyses conducted for this report. The approximately 13,000 forms not included in the analyses lacked certain key data elements or had obvious errors (e.g., invalid ambulance ID number).

A revised ambulance emergency medical services record was put into use on January 1, 1979 (Appendix A). The revised form combined items from the old long and short forms and included additional data elements. The new form requests information on attendant training level, communications enroute, level of service provided, type of illness and accident type – not available from the old form. The new form permits comparison of condition at scene (severity) with condition at destination. Limitations in the data set used to prepare this report must be acknowledged when interpreting the results. The relatively high proportion (19%) of unusable forms makes it difficult to draw firm conclusions or make definitive correlations from the data. In addition, it is very difficult to estimate the extent of under-reporting of total runs to the MDH by ambulance services.

The ambulance trip form data set does comprise a valuable resource in spite of the above mentioned limitations. When used appropriately, it can be a valuable aid to EMS providers, health planners, and health care facilities.

GENERAL OVERVIEW

Services by Annual Run Volume

The Metropolitan region accounted for over 70 percent of all reported runs in 1979 (Table 1). As a result, trends in the Metropolitan region tend to influence statewide descriptions of ambulance run data.

Approximately seventy percent of the 289 ambulance services* in Minnesota reported fewer than 100 runs per year. Forty-eight percent reported fewer than 50 runs per year (Table 2). The Metropolitan region had a low proportion of ambulance services which reported fewer than 100 runs per year compared to outstate regions and is the only region which had ambulance services reporting more than 2,000 runs per year.

Utilization Rates

Overall ambulance utilization rates were calculated using 1979 regional population estimates. Utilization rates by severity and region are presented in Table 3. Ambulance utilization was highest for the less severe runs and lowest for critical and fatal runs, in each region and the State as a whole.

For all levels of severity combined, the Metro region had the highest utilization rates, 204.1 runs per 10,000 population, in contrast to the balance of the State's utilization rate of 72.8 runs per 10,000 population. This marked contrast appears to be largely due to the high rates for minor runs in the Metro region (109.3/10,000) compared to the minor run utilization rate of 20.8/10,000 for the rest of the State, suggesting that ambulance service utilization patterns in the Metro region were substantially different than the remainder of the State. This type of contrast is present for a variety of factors and characteristics associated with ambulance utilization as will be described in subsequent sections.

TABLE 1

REPORTED AMBULANCE RUN VOLUME BY EMS REGION MINNESOTA, 1979

EMS REGION	Reported 1979 Run Volume	Percent of Total State Runs
Agassiz	935	1.7
Arrowhead	4,041	7.2
Central	4,025	7.1
Min-Dak	1,106	2.0
South Central	1,431	2.5
Southeast	3,216	5.7
Southwest	1,362	2.4
Metro	40,321	71.4
STATE TOTAL	56,437	100.0

TABLE 2

NUMBER OF AMBULANCE SERVICES BY RUN VOLUME* BY EMS REGION MINNESOTA, 1979

EMS REGION	Total Ambulance Services		1979 RUN VOLUME															
			0-49		50-100		101-200		201-500		501-1000		1001-2000		>2000		Unknown	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Agassiz	23	100.0	10	43.5	7	30.4	1	4.3	–	–	–	–	–	–	–	–	5	21.7
Arrowhead	33	100.0	11	33.3	9	27.3	7	21.2	2	6.1	–	–	1	3.0	–	–	3	9.1
Central	40	100.0	14	35.0	12	30.0	7	17.5	3	7.5	2	5.0	–	–	–	–	2	5.0
Min-Dak	21	100.0	9	42.9	7	33.3	3	14.3	–	–	–	–	–	–	–	–	2	9.5
South Central	32	100.0	20	62.5	3	9.4	3	9.4	2	6.3	–	–	–	–	–	–	4	12.5
Southeast	44	100.0	27	61.4	8	18.2	2	4.5	3	6.8	1	2.3	–	–	–	–	3	6.8
Southwest	62	100.0	42	67.7	10	16.1	1	1.6	–	–	–	–	–	–	–	–	9	14.5
Non-Metro Total	256	100.0	133	52.2	56	22.0	24	9.4	10	3.9	3	1.1	1	0.4	–	–	28	11.0
Metro	34	100.0	6	17.6	5	14.7	6	17.6	7	20.6	3	8.8	1	2.9	6	17.6	–	–
STATE TOTAL	289	100.0	139	48.1	61	21.1	30	10.4	17	5.9	6	2.1	2	0.7	6	2.1	28	9.7

*Run Volume = total number of runs in 1979 per ambulance service.

*Ambulance services were defined on the basis of land services licensed in Minnesota. Services with more than one base of operation were considered as a single service.

Services Provided

The majority of runs made in 1979 involved both the treatment and transportation of patients (Table 4). Overall, greater than 90 percent of all runs fall into this category. The Metro region had the greatest proportion of runs in which either no treatment was rendered, treatment was rendered with no transportation, or the run was cancelled enroute, at almost 10 percent of the total Metro runs, in contrast to the remainder of the State which had 1.7 percent of all runs in this category.

Level of Ambulance Service

Personnel training level information for each run was used to determine the highest level of training present on each run. This information was then combined with information as to the type of the ambulance service, advanced life support or basic life support, to describe the overall level of service present on each run.

Advanced life support (ALS) ambulance services have the capability to render interventive medical care, providing treatments such as intubation, defibrillation and administering intravenous fluids and medications under the direction of a physician. ALS services may be provided by physicians, nurses or emergency medical technician-paramedics (EMT-P). Basic life support (BLS) ambulance services have the capability to provide basic measures to reduce the seriousness of an emergency situation, protect patients from additional hazards and transport patients to appropriate facilities for treatment. Training standards for BLS services require an Advanced Red Cross (ARC) first aid certificate as the minimum level of training.

The following categories were created to describe the overall level of service present on each run:

- ALS – Advanced life support ambulance service with at least one attendant with a training level of M.D., R.N., or EMT-P (paramedic)
- BLS/EMT-P – Basic life support ambulance service with at least one attendant with a training level of M.D., R.N., or EMT-P.
- BLS/EMT-A – Basic life support ambulance service with at least one attendant with a training level of EMT-A (81-hr. EMT)
- BLS/ARC – Basic life support ambulance service with American Red Cross first aid training as the highest training level present

The distribution of reported runs according to service level and region is presented in Table 5. Statewide, most reported runs were made with personnel trained at a minimum of the EMT-A level. The Metro region had a higher proportion of ALS runs than other regions. Non-metro regions had a high proportion (71.8%) of runs made at the BLS/EMT-A level. Agassiz had the highest proportion of runs made at the BLS/ARC level 12.1%.

TABLE 3

AMBULANCE UTILIZATION RATES* BY EMS REGION BY CONDITION AT SCENE MINNESOTA, 1979

EMS REGION	CONDITION AT SCENE					
	Fatal	Critical	Urgent	Minor	Unknown	Total
Agassiz	1.8	14.1	28.4	13.7	0.7	57.9
Arrowhead	2.1	22.9	52.6	36.6	0.2	117.5
Central	2.0	17.8	41.3	28.6	0.3	90.3
Mid-Dak	1.0	10.7	29.4	14.3	–	55.4
South Central	1.4	12.2	30.0	21.3	0.1	64.9
Southeast	0.9	15.6	40.7	21.8	0.1	79.2
Southwest	1.0	11.7	22.2	9.3	0.1	44.3
Non Metro Total	*1.5*	*15.8*	*37.0*	*23.0*	*0.2*	*77.3*
Metro	2.0	18.2	74.0	109.3	0.7	204.1
STATE TOTAL	1.7	16.9	55.0	65.0	0.4	139.0

*Utilization Rates defined as number of ambulance runs per 10,000 resident population. Regional populations provided by the Office of the State Demographer.

TABLE 4

PERCENTAGE OF REGIONAL RUNS BY SERVICE PROVIDED BY EMS REGION MINNESOTA, 1979

EMS REGION	SERVICE PROVIDED					
	Total (Percent)	Treatment and Transport (Percent)	Treatment Only (Percent)	No Treatment or Transport (Percent)	Cancelled Enroute (Percent)	Unknown (Percent)
Agassiz	100.0	97.1	0.2	0.7	0.1	1.8
Arrowhead	100.0	98.4	0.1	0.9	0.2	0.4
Central	100.0	97.7	0.3	0.9	0.3	0.7
Mid-Dak	100.0	99.2	–	0.7	–	0.1
South Central	100.0	98.4	0.3	1.0	0.1	0.2
Southeast	100.0	98.8	0.1	0.5	0.1	0.4
Southwest	100.0	98.5	0.4	0.7	0.1	0.4
Metro	100.0	90.1	4.9	4.4	0.4	0.2
STATE TOTAL	100.0	92.5	3.6	3.4	0.3	0.3

Response Times and Mileage

Average response times were calculated on a regional basis for four time intervals — call to enroute, base to scene, time at scene and scene to hospital, as illustrated in Table 6. By elimination of those runs which had questionable values, the response times (and mileage) presented in Table 6 are more accurate than have been reported in previous years, making trend analyses difficult.

Several patterns are present in the 1979 data: 1) regions with urban centers (Metro, Arrowhead and Southeast) respond faster than other regions; 2) the distance between base and scene was lowest in the Metro area but travel times between base and scene did not vary much among regions; 3) the Metro and Arrowhead regions averaged more time spent at the scene than other regions; 4) travel time between the scene and the hospital was lowest in the Metro region; 5) total time elapsed and total distance were

TABLE 5

PERCENTAGE OF REGIONAL RUNS BY TRAINING/ AMBULANCE SERVICE LEVEL BY EMS REGION MINNESOTA, 1979

EMS REGION	TRAINING/AMBULANCE SERVICE LEVEL					
	Total (Percent)	ALS (Percent)	BLS/EMT-P (Percent)	BLS/EMT-A (Percent)	BLS/ARC (Percent)	Unknown (Percent)
Agassiz	100.0	–	15.1	72.5	12.1	0.3
Arrowhead	100.0	38.8	2.9	52.6	5.1	0.6
Central	100.0	–	16.1	80.6	2.7	0.6
Min-Dak	100.0	–	4.7	94.6	0.1	0.6
South Central	100.0	–	7.5	83.5	7.5	1.4
Southeast	100.0	26.3	3.7	66.6	3.0	0.3
Southwest	100.0	–	7.9	83.4	7.2	1.5
Non Metro Total	*100.0*	*15.0*	*8.0*	*71.8*	*4.5*	*0.7*
Metro	100.0	75.6	4.3	19.2	0.6	0.4
STATE TOTAL	100.0	58.3	5.3	34.2	1.7	0.5

TABLE 6

AVERAGE RESPONSE TIME AND MILEAGE BY EMS REGION MINNESOTA, 1979

EMS REGION	AVERAGE MILEAGE			AVERAGE TIME (Minutes)				
	Total Miles*	Base to Scene	Scene to Hospital	Total Time*	Call to Enroute	Base to Scene	Time at Scene	Scene to Hospital
Agassiz (N=878)**	19.5	7.0	12.5	42.0	3.7	9.2	9.8	19.3
Arrowhead (N=3,836)**	12.1	4.8	7.3	34.6	1.6	6.7	13.0	13.3
Central (N=3,848)**	16.6	6.4	10.2	36.4	3.4	7.8	9.9	15.3
Min-Dak (N=1,083)**	17.0	6.0	11.0	38.0	3.3	7.7	10.3	16.7
South Central (N=1,364)**	11.8	4.5	7.3	34.2	3.6	6.0	9.5	15.1
Southeast (N=3,131)**	12.8	4.6	8.2	30.5	1.4	5.8	10.3	13.0
Southwest (N=1,274)**	12.3	4.6	7.7	32.5	3.9	6.0	10.7	11.9
Metro (N=36,685)**	8.4	3.4	5.0	30.1	1.4	6.2	12.7	9.8
STATE TOTAL	10.1	4.0	6.1	31.6	1.8	6.4	12.2	11.2

**Total Average Times and Mileages do not include return times or miles from the hospital back to the Ambulance Service.*

***N (number of ambulance runs used in calculations) is less than actual regional totals due to editing.*

lowest in the Metro region and the southern portion of the State. These patterns are consistent with regional characteristics. Regions with large, non-volunteer services tended to respond more quickly than did regions with predominantly volunteer services. Mileages were lower in the Metro area but Metro travel times were not markedly lower than non-metro regions, possibly due to slower urban driving conditions. Regions with ALS services spent more time at the scene than did regions with BLS services. ALS services can provide more treatments at the scene than BLS services and could be expected to spend more time at the scene.

Communications

A majority of ambulance runs involved some enroute communication with a hospital (Table 7). Statewide, the hospital was notified prior to arrival in 74 percent of all runs. Notification rates were lowest in the Metro region (67.4%) compared to 92 percent for the remainder of the State combined. This contrast may be due to some of the unique characteristics of the Metro region such as the relatively high proportion of runs (10%) in which the patient was not transported to a hospital, the high proportion of minor runs, 24 hour physician staffing in many emergency departments, and relatively short times and distances between the scene and the hospital. Radio medical advice enroute occurred most frequently in those regions with ALS ambulance services – Metro, Arrowhead and Southeast. The Metro region had the highest proportion of all runs in this category with 16.7 percent, compared to a combined rate of 9.5 percent for the balance of the State.

TABLE 7

PERCENTAGE OF REGIONAL RUNS IN WHICH COMMUNICATIONS WITH HOSPITAL WERE NOTED ENROUTE TO HOSPITAL BY EMS REGION MINNESOTA, 1979

	COMMUNICATIONS		
EMS REGION	Hospital Notified Prior to Arrival (Percent)	Hospital Prepared (Percent)	Radio Medical Advice Enroute (Percent)
Agassiz	90.8	78.1	5.9
Arrowhead	91.1	77.4	13.7
Central	92.2	82.2	5.6
Min-Dak	92.5	83.2	4.4
South Central	86.9	78.3	10.3
Southeast	95.4	87.6	11.8
Southwest	89.9	81.1	9.0
Non Metro Total	*92.0*	*81.5*	*9.5*
Metro	67.4	61.6	16.7
STATE TOTAL	74.4	67.2	14.6

PATIENT CHARACTERISTICS

Demographic Characteristics

The distribution of all ambulance runs for which information on age and sex is available is presented in Figure 1. Eight percent of all runs statewide were made for persons less than 15 years old. The highest proportion of runs occurs in the greater than 65 year age category and is consistent across all regions of the State. A higher proportion of runs was made for males in every age group except for the greater than 65 year age group in which females dominate. The same distribution for Minnesota population as a whole (based on projected figures for 1980) is presented in Figure 2.

Condition at the Scene (Severity)

A determination of the patient's condition at the scene and at the destination is made by ambulance personnel using a four category severity scoring system. Definitions of the four categories are presented in the ambulance trip form instruction manual as follows:

Critical: (Emergent) Requires immediate medical attention. Delay is harmful to patient. Disorder is acute and potentially threatens life of function.

Urgent: (Non-critical). Requires medical attention within a few hours. In danger if not attended. Disorder is acute, but not necessarily severe.

Minor: (Non-emergent). Disorder is minor or non-acute.

Fatal: "Apparent Death" at the scene – the patient is obviously DOA and is not transported, or if the patient is transported to a funeral home or morgue, direct from the scene. "Apparent Death" at the destination – the patient is pronounced dead on arrival, or if resuscitation efforts fail within a short period after arrival and the patient is pronounced dead.

Statewide, condition at the scene was determined to be minor in 47% of all runs. This figure is heavily influenced by the Metro region in which the condition at the scene was minor for over 50 percent of all runs. Condition at the scene was determined to be minor in 30 percent of the runs for the remainder of the State. The pattern is reversed for the proportion of runs in which the condition at the scene was determined to be critical: in the Metro region 8.9 percent of the runs were critical versus 20.4 percent for the rest of the State combined (Table 8).

It is not possible to determine whether these differences are due to real differences in ambulance service utilization patterns or to differing severity assessment techniques. However, since the same type of contrast (Metro vs. outstate) occurs consistently for a number of characteristics, this may reflect true differences in ambulance utilization patterns between the Metro region and the rest of the State.

TABLE 8

AMBULANCE RUNS BY PATIENT'S CONDITION AT SCENE BY EMS REGION MINNESOTA, 1979

	CONDITION AT SCENE											
	Total		Fatal		Critical		Urgent		Minor		Unknown	
EMS REGION	#	%	#	%	#	%	#	%	#	%	#	%
Agassiz	935	100.0	26	2.8	228	24.4	458	49.0	221	23.6	2	0.2
Arrowhead	4,041	100.0	74	1.8	788	19.5	1,808	44.7	1,363	33.7	8	0.2
Central	4,025	100.0	88	2.2	795	19.8	1,851	46.0	1,277	31.7	14	0.3
Min-Dak	1,106	100.0	21	1.9	214	19.3	586	53.0	285	25.8	–	–
South Central	1,431	100.0	30	2.1	269	18.8	662	46.3	469	32.8	1	0.1
Southeast	3,216	100.0	37	1.2	635	19.7	1,655	51.5	884	27.5	5	0.2
Southwest	1,362	100.0	33	2.4	358	26.3	683	50.1	287	21.1	1	0.1
Non Metro Total	16,116	100.0	309	1.9	3,287	20.4	7,703	47.8	4,786	29.7	31	0.2
Metro	40,321	100.0	388	1.0	3,587	8.9	14,614	36.2	21,588	53.5	144	0.4
STATE TOTAL	56,437	100.0	697	1.2	6,874	12.2	22,317	39.5	26,374	46.7	175	0.3

FIGURE 1
PERCENT OF TOTAL AMBULANCE RUNS BY AGE AND SEX MINNESOTA, 1979

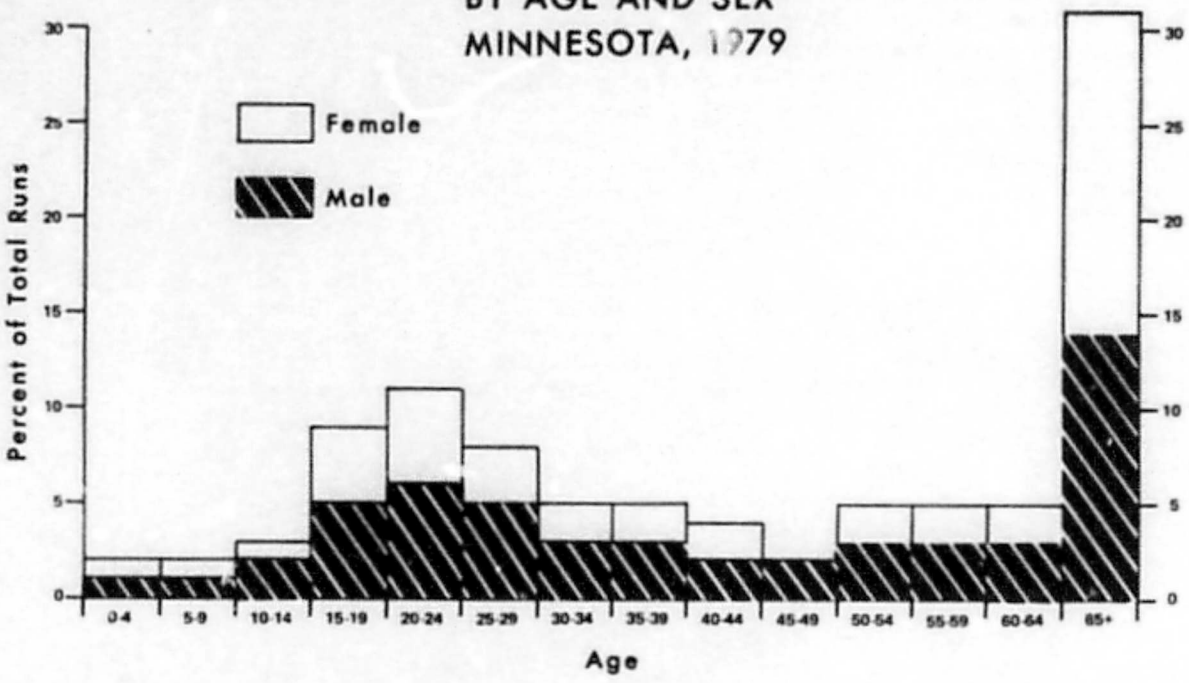
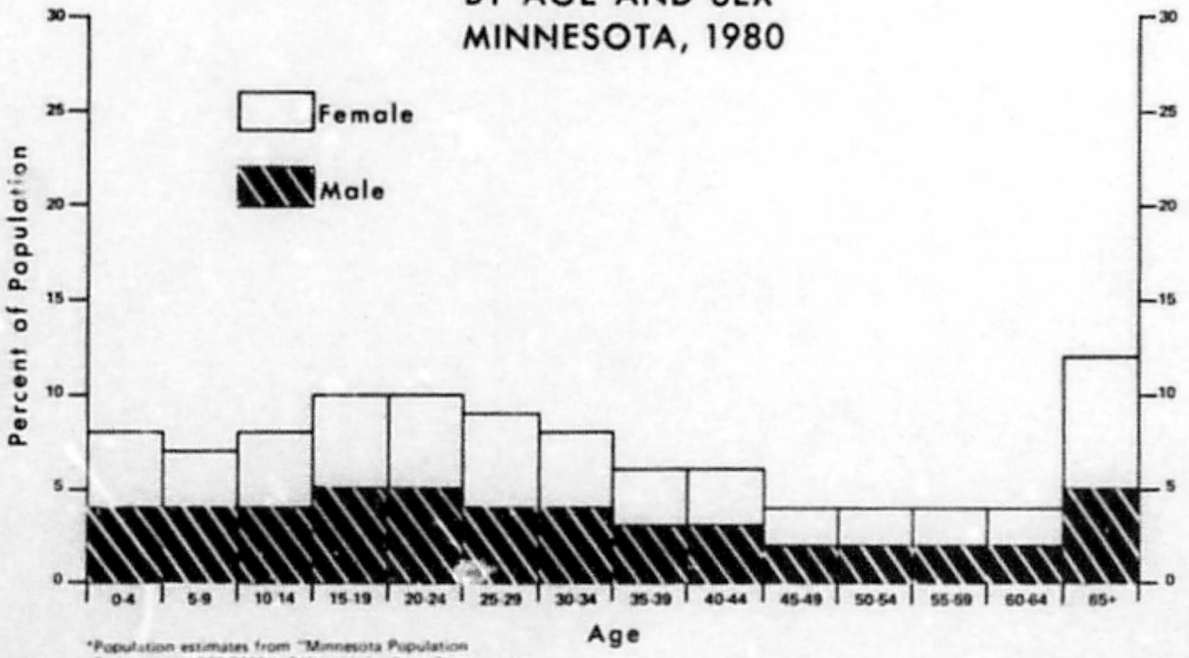


FIGURE 2
PERCENT OF TOTAL POPULATION* BY AGE AND SEX MINNESOTA, 1980



*Population estimates from "Minnesota Population Projections, 1970-2000", Office of the State Demographer

Severity Status Changes

Severity status changes enroute can be determined by comparing the condition at the scene with condition upon arrival at a hospital. This comparison was made on the basis of no change in status, improved status, deteriorated status and unknown status. The results of this comparison for all reported runs with regional and state totals are presented in Table 9. The majority of runs (93%) resulted in no change or improved status. Severity status deteriorated in approximately 1% of the runs statewide, with little variation among regions.

A similar comparison was made, restricted to urgent and critical runs only, to determine whether or not there was a different pattern of severity status changes enroute for these potentially serious runs. A slightly higher proportion of these runs deteriorated enroute, compared to the same analysis for all runs. There was no change in status or improved status enroute in 97% of these urgent and critical runs (Table 10).

TABLE 9

PERCENTAGE OF REGIONAL RUNS IN WHICH CHANGE IN PATIENT'S CONDITION ENROUTE FROM SCENE TO HOSPITAL WAS NOTED BY EMS REGION MINNESOTA, 1979

EMS REGION	Total (Percent)	No Change (Percent)	Improved (Percent)	Deteriorated (Percent)	Unknown (Percent)
Agassiz	100.0	89.9	8.0	1.4	0.6
Arrowhead	100.0	88.5	9.9	0.9	0.7
Central	100.0	93.8	4.3	0.8	1.1
Min-Dak	100.0	91.4	7.1	0.8	0.7
South Central	100.0	94.8	3.9	0.8	0.5
Southeast	100.0	85.7	13.1	1.0	0.2
Southwest	100.0	90.2	7.6	1.5	0.7
Non Metro Total	*100.0*	*90.2*	*8.1*	*1.0*	*0.7*
Metro	100.0	86.4	4.2	0.6	8.8
STATE TOTAL	100.0	87.5	5.3	0.7	6.5

TABLE 10

PERCENTAGE OF REGIONAL RUNS IN WHICH CHANGE IN PATIENT'S CONDITION ENROUTE FROM SCENE TO HOSPITAL WAS NOTED BY EMS REGION FOR CRITICAL AND URGENT CASES ONLY MINNESOTA, 1979

EMS REGION	Total (Percent)	No Change (Percent)	Improved (Percent)	Deteriorated (Percent)	Unknown (Percent)
Agassiz	100.0	87.5	10.9	1.6	–
Arrowhead	100.0	83.2	15.4	1.3	0.1
Central	100.0	92.2	6.6	1.0	0.2
Min-Dak	100.0	89.0	9.8	1.1	0.1
South Central	100.0	93.1	6.0	0.9	–
Southeast	100.0	80.5	18.3	1.1	0.1
Southwest	100.0	88.3	9.9	1.5	0.3
Non Metro Total	*100.0*	*86.8*	*11.9*	*1.2*	*0.1*
Metro	100.0	87.4	9.3	0.7	2.6
STATE TOTAL	100.0	87.2	10.2	0.9	1.7

EMS CLINICAL CATEGORIES

EMS planning characterizes patients on the basis of seven clinically defined categories – cardiac, trauma, behavioral, perinatal, spinal cord injury, poison, and burn. Ambulance trip form illness type, injury type and injury site criteria were used to classify ambulance runs on the basis of these categories. The criteria used to define each category are listed in Table 11. The categories are not mutually exclusive – for example, spinal cord injury runs are included in the trauma category. A separate category has been created for those runs not falling into any of the EMS clinical categories, which will be referred to as general runs.

Each EMS clinical category will be briefly described. Reported treatments administered within each EMS clinical category are presented in Table 12. Any analysis of the type and frequency of treatments administered should be interpreted cautiously due to the limitations described in the introduction of this report. A limited analysis was conducted, however, to demonstrate the potential for analysis of this topic and to provide the basis for future trend analyses.

TABLE 11

ILLNESS AND INJURY CRITERIA (DERIVED FROM "AMBULANCE TRIP FORM") USED TO CLASSIFY AMBULANCE RUNS BY EMS CLINICAL CATEGORIES

EMS Clinical Category	Illness Criteria	Injury Type Criteria	Injury Site Criteria
Cardiac	Cardiac Symptoms	–	–
Trauma	–	All types except burn	All sites
Behavioral	Confusion/Anxiety/ Agitation/Alcohol-Drug Abuse/Overdose	–	–
Perinatal	All illness codes for persons less than 1 year old	–	–
Spinal Cord Injury	–	Crushing, dislocation, fracture (open & closed), sprain/strain, penetrating injury and other	Neck/Spinal Columns
Poison	Poisoning other than alcohol & drug overdose	–	–
Burn	–	Burn	Any site
General	Abdominal symptoms, allergic reaction, respiratory problems, convulsions/seizure, diabetic complications, fever/chills, infection, heat prostration, nausea/vomitting, paralysis, pain (other)		

TABLE 12

AMBULANCE RUNS BY TYPE OF TREATMENT RENDERED WITHIN EMS CLINICAL CATEGORY MINNESOTA, 1979

TYPE OF TREATMENT	EMS CLINICAL CATEGORY															
	Cardiac (N=7,425)*		Trauma (N=27,683)*		Behavioral (N=4,116)*		Perinatal (N=499)*		Spinal Cord Injury (N=1,056)*		Poison (N=167)*		Burn (N=398)*		General (N=16,835)*	
	#	%**	#	%**	#	%**	#	%**	#	%**	#	%**	#	%**	#	%**
Establish Airway	2,137	*28.8*	3,884	*14.0*	535	*13.0*	75	*15.0*	204	*19.3*	25	*15.0*	60	*15.1*	2,502	*14.9*
Oxygen	5,799	*78.1*	4,466	*16.1*	524	*12.7*	96	*19.2*	176	*16.7*	80	*47.9*	77	*19.3*	4,114	*24.4*
Irrigation	9	*0.1*	48	*0.2*	2	*0.0*	3	*0.6*	1	*0.1*	2	*1.2*	79	*19.8*	30	*0.2*
Oral Airway	283	*3.8*	259	*0.9*	48	*1.2*	11	*2.2*	18	*1.7*	4	*2.4*	3	*0.8*	138	*0.8*
Suction	244	*3.3*	376	*1.4*	30	*0.7*	14	*2.8*	30	*2.8*	2	*1.2*	5	*1.3*	232	*1.4*
Endotracheal Tube	64	*0.9*	29	*0.1*	10	*0.2*	2	*0.4*	5	*0.5*	1	*0.6*	2	*0.5*	22	*0.1*
Esophageal Tube	647	*8.7*	187	*0.7*	12	*0.3*	1	*0.2*	8	*0.8*	3	*1.8*	4	*1.0*	48	*0.3*
CPR	1,001	*13.5*	317	*1.1*	5	*0.1*	16	*3.2*	18	*1.7*	4	*2.4*	6	*1.5*	68	*0.4*
Citizen CPR	273	*3.7*	83	*0.3*	1	*0.0*	4	*0.8*	5	*0.5*	2	*1.2*	3	*0.8*	20	*0.1*
Pulmonary Resuscitation	372	*5.0*	157	*0.6*	15	*0.4*	11	*2.2*	8	*0.8*	–	–	3	*0.8*	80	*0.5*
Telemetry/ECG Monitor	4,184	*56.4*	1,548	*5.6*	306	*7.4*	35	*7.0*	31	*2.9*	24	*14.4*	20	*5.0*	1,728	*10.3*
Defibrillation	483	*6.5*	72	*0.3*	3	*0.1*	–	–	–	–	–	–	1	*0.3*	25	*0.1*
IV Fluids	3,531	*47.6*	1,795	*6.5*	290	*7.0*	10	*2.0*	46	*4.4*	18	*10.8*	44	*11.1*	1,668	*9.9*
Medications	1,926	*25.9*	584	*2.1*	161	*3.9*	7	*1.4*	6	*0.6*	6	*3.6*	25	*6.3*	768	*4.6*
Limb Splints	42	*0.6*	2,953	*10.7*	31	*0.8*	1	*0.2*	56	*5.3*	–	–	10	*2.5*	727	*4.3*
Traction Splints	1	*0.0*	343	*1.2*	3	*0.1*	–	–	15	*1.4*	–	–	–	–	92	*0.5*
Spine Board	285	*3.8*	5,368	*19.4*	133	*3.2*	5	*1.0*	649	*61.5*	4	*2.4*	25	*6.3*	1,611	*9.6*
Cervical Collar	20	*0.3*	2,445	*8.8*	45	*1.1*	–	–	590	*55.9*	1	*0.6*	9	*2.3*	682	*4.1*
Control Bleeding	29	*0.4*	5,591	*20.2*	177	*4.3*	11	*2.2*	132	*12.5*	1	*0.6*	17	*4.3*	1,005	*6.0*
Extrication	20	*0.3*	718	*2.6*	17	*0.4*	–	–	116	*11.0*	1	*0.6*	6	*1.5*	158	*0.9*
Neonatal Incubator	2	*0.0*	7	*0.0*	–	–	32	*6.4*	–	–	–	–	–	–	6	*0.0*
Obstetrical	2	*0.0*	56	*0.2*	–	–	3	*0.6*	1	*0.1*	–	–	–	–	6	*0.0*
Anti-Shock Trousers	37	*0.5*	259	*0.9*	11	*0.3*	–	–	11	*1.0*	–	–	1	*0.3*	118	*0.7*
Patient Restraints	3	*0.0*	122	*0.4*	150	*3.6*	–	–	6	*0.6*	–	–	3	*0.8*	59	*0.4*
Other	193	*2.6*	1,525	*5.5*	134	*3.3*	29	*5.8*	46	*4.4*	8	*4.8*	76	*19.1*	933	*5.5*
No Reported Treatment	934	*12.6*	10,240	*37.0*	2,620	*63.7*	309	*61.9*	201	*19.0*	72	*43.1*	169	*42.5*	7,865	*46.7*

**N= Total number of ambulance runs which fit specifications for clinical category (see list of category specifications in Table 11).*

***%= Percent of total ambulance runs within each clinical category for each treatment rendered; e.g., establishing an airway was done in 28.8% of the total cardiac cases.*

TABLE 13

AMBULANCE RUNS BY EMS CLINICAL CATEGORY
BY CONDITION AT SCENE
MINNESOTA, 1979

CONDITION AT SCENE	EMS CLINICAL CATEGORY															
	Cardiac		Trauma		Behavioral		Perinatal		Spinal Cord Injury		Poison		Burn		General	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Minor	852	*11.5*	13,749	*49.7*	2,415	*58.7*	206	*41.3*	384	*36.4*	51	*30.5*	109	*27.4*	8,037	*47.7*
Urgent	3,959	*53.3*	10,981	*39.7*	1,398	*34.0*	178	*35.7*	527	*49.9*	83	*49.7*	199	*50.0*	7,104	*42.2*
Critical	2,415	*32.5*	2,830	*10.2*	298	*7.2*	110	*22.0*	131	*12.4*	30	*18.0*	88	*22.1*	1,668	*9.9*
Fatal	199	*2.7*	123	*0.4*	5	*0.1*	5	*1.0*	14	*1.3*	3	*1.8*	2	*0.5*	26	*0.2*
TOTAL	7,425	*100.0*	27,683	*100.0*	4,116	*100.0*	499	*100.0*	1,056	*100.0*	167	*100.0*	398	*100.0*	16,835	*100.0*

Cardiac

There were 7,425 cardiac runs reported in 1979. The majority of these runs were made for persons greater than age 50 with the highest proportion occurring in the age group greater than 65. The age and sex distribution of cardiac runs is presented in Figure 3. Eighty-six percent of the cardiac runs were determined to be urgent or critical, the highest proportion of urgent and critical runs of any clinical category (Table 13).

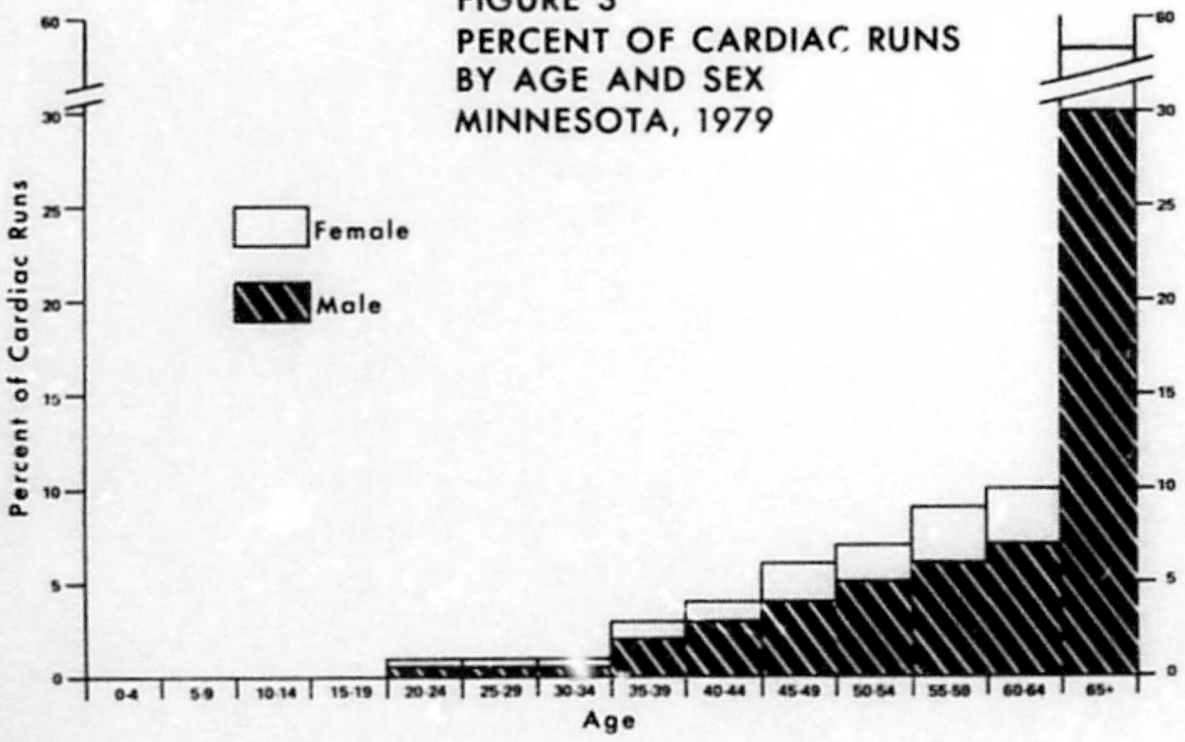
Statewide, cardio-pulmonary resuscitation (CPR) was administered in a total of 17 percent of all cardiac runs, cardiac monitoring (ECG) via a radio link to a hospital conducted in 56 percent of the runs and electrical stimulation of the heart (defibrillation) administered in 7 percent of cardiac runs. Intravenous fluids were administered in 48 percent of the runs and medications given in 26 percent of the runs. In general, cardiac patients received more pre-hospital treatments in the Metro region as compared to all other regions combined, as illustrated in Table 14. This pattern is consistent with the high proportion of ALS services in the metro region – provision of these types of treatment is limited to ALS services.

TABLE 14

PERCENT OF CARDIAC RUNS FOR WHICH SPECIFIC TYPES OF TREATMENTS WERE ADMINISTERED METRO vs. NON METRO MINNESOTA, 1979

TREATMENT	Percent of Metro Cardiac Runs	Percent of Non Metro Cardiac Runs	Percent of Total State Cardiac Runs
Oxygen	81.2	72.2	78.1
CPR	15.8	19.7	17.2
Telemetry/ECG Monitor	75.5	20.0	56.4
Defibrillation	8.7	2.4	6.5
IV Fluids	64.3	15.7	47.6
Medications	35.5	7.7	25.9

FIGURE 3
PERCENT OF CARDIAC RUNS
BY AGE AND SEX
MINNESOTA, 1979



Trauma

The highest percentage of trauma runs (23%) occurred among patients older than 65, in contrast to what would be expected. Previous trauma studies have indicated that the highest percentage of trauma normally occurs among persons 15 to 30 years old with only a slightly higher percentage among persons older than 65.[1],[2] The contrast present in the ambulance data may be due to persons older than 65 being more likely to use an ambulance than younger persons for an injury of equal severity.

Fifty percent of all trauma runs were assessed as minor at the scene, 10 percent assessed as critical, as illustrated in Table 13.

Injury type according to the site of injury is presented in Table 15. Soft tissue injuries (contusion and open wounds) were the most commonly reported types of injuries, comprising 45 percent of all injuries. Suspected fractures accounted for 15 percent of the total injuries. The head was the most commonly reported site of injury with 36 percent of the injuries. The extremities comprised another 31 percent of all reported injuries.

The type of accident was reported for 68 percent of the trauma runs. The distribution of accident type for those runs in which it was recorded is presented in Table 16. Motor vehicle accidents (auto/truck, motorcycle, pedestrian) accounted for 31 percent of all trauma runs, falls accounted for another 19 percent. These data should be interpreted cautiously due to the large proportion of runs for which type of accident is unknown.

TABLE 16

TRAUMA RUNS BY TYPE OF ACCIDENT MINNESOTA, 1979

TYPE OF ACCIDENT	TRAUMA RUNS #	TRAUMA RUNS %
Auto/Truck	7,098	25.6
Motorcycle	936	3.4
Pedestrian	547	2.0
Bicycle	448	1.6
Snowmobile	64	0.2
Machine/Tool	492	1.8
Fire/Explosion	60	0.2
Fall	5,130	18.5
Violence	1,203	4.3
Other	2,933	10.6
Unknown	8,772	31.7
TOTAL	27,683	100.0

TABLE 15

PERCENTAGE* OF TOTAL TRAUMA RUNS BY SITE OF INJURY BY TYPE OF INJURY MINNESOTA, 1979

	SITE OF INJURY									
TYPE OF INJURY	Head (Percent)	Neck (Percent)	Upper Extremity (Percent)	Back (Percent)	Chest (Percent)	Abdomen (Percent)	Pelvis (Percent)	Upper Leg (Percent)	Lower Leg (Percent)	Total (Percent)
Open Fracture	0.2	0.1	0.3	0.0	0.0	0.0	0.1	0.3	0.8	1.8
Closed Fracture	0.8	0.7	2.5	0.3	0.6	0.0	1.1	3.6	3.6	13.2
Dislocation	0.1	0.1	1.0	0.1	0.0	0.0	0.1	0.3	0.7	2.3
Sprain	0.0	1.0	0.3	1.7	0.1	0.1	0.1	0.2	1.2	4.8
Amputation	0.1	0.0	0.3	–	–	–	–	0.0	0.1	0.5
Crushing	0.3	0.1	0.4	0.2	0.4	0.1	0.1	0.1	0.3	1.8
Open Wound	10.3	0.1	2.6	0.2	0.1	0.1	0.1	0.3	1.3	15.1
Penetrating Injury	0.3	0.0	0.2	0.1	0.2	0.1	0.0	0.1	0.2	1.3
Bleeding	2.9	0.1	0.5	0.0	0.1	0.5	0.5	0.0	0.2	4.7
Contusion	15.4	1.8	2.4	2.6	2.0	0.9	0.7	1.5	2.8	30.0
Other	5.5	1.2	1.6	1.8	8.6	3.4	0.6	0.8	1.0	24.5
TOTAL	35.8	5.1	12.1	7.0	12.2	5.3	3.4	7.1	12.1	100.0

Percentages calculated on the basis of the total number of trauma runs, N = 27,683.

[1]Krause, J.R., et al. Incidence of Traumatic Spinal Cord Lesions. *J. of Chronic Diseases*, 28:471-492, 1975.

[2]Motor Vehicle Crash Facts, Minnesota Department of Public Safety, 1979.

FIGURE 4
PERCENT OF TRAUMA RUNS
BY AGE AND SEX
MINNESOTA, 1979

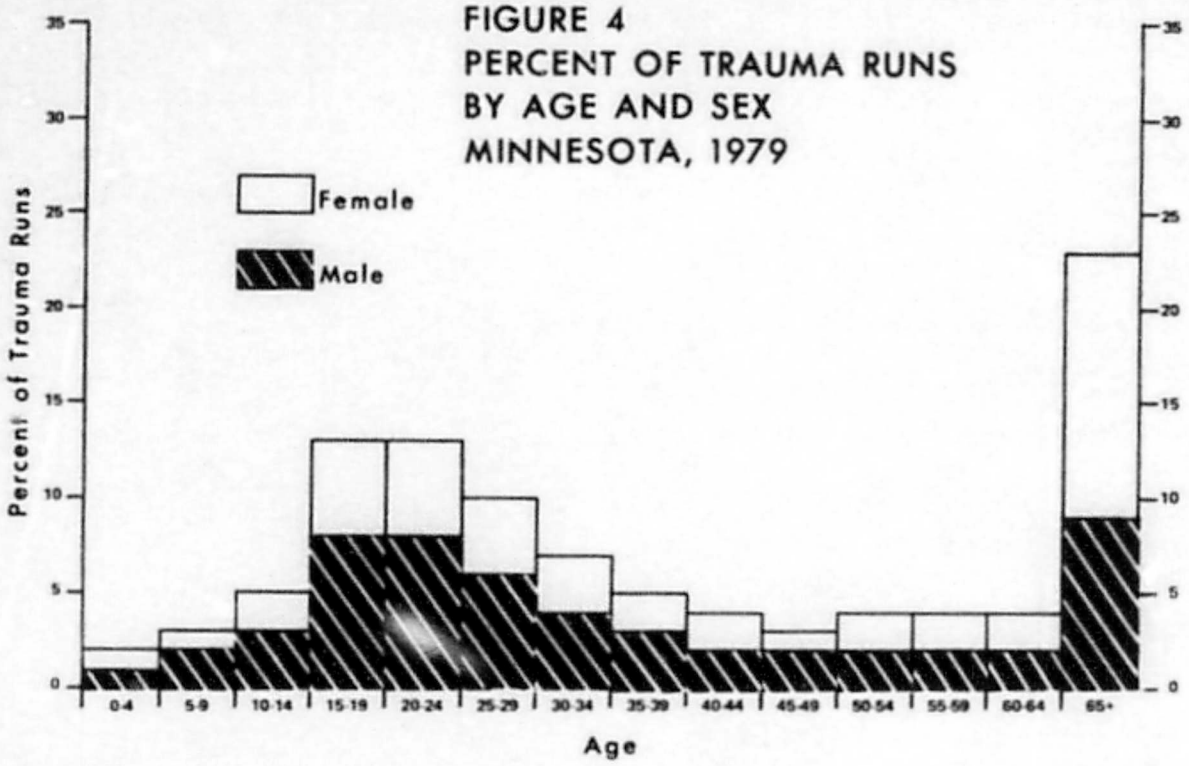
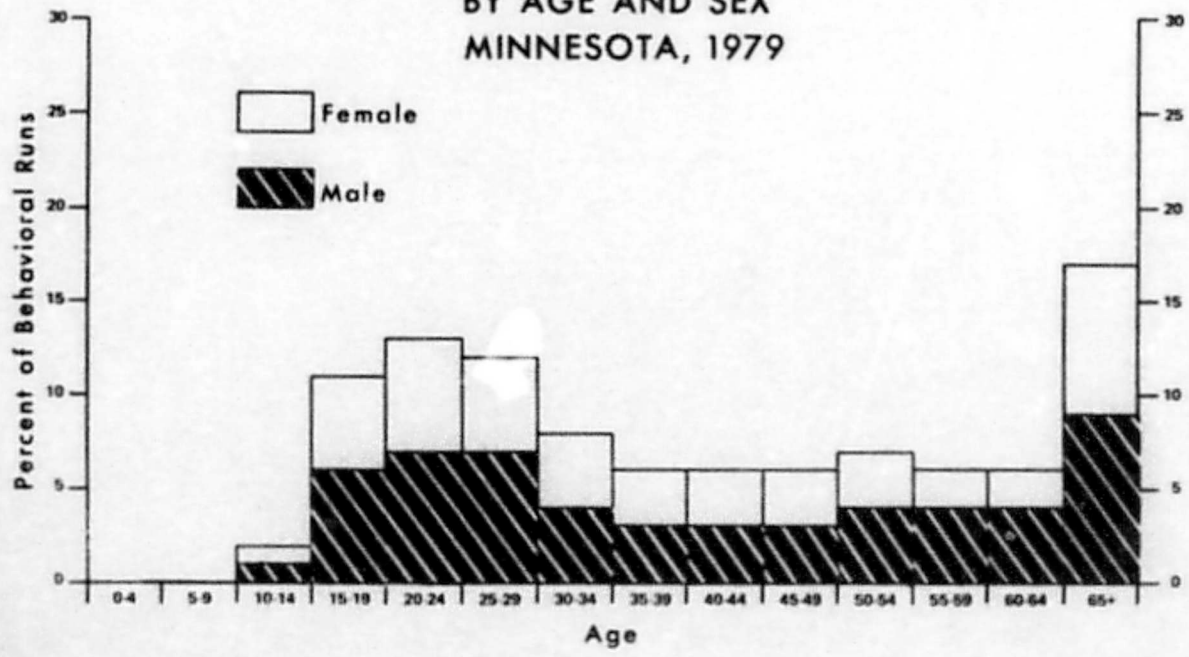


FIGURE 5
PERCENT OF BEHAVIORAL RUNS
BY AGE AND SEX
MINNESOTA, 1979



Behavioral Crisis

There were a total of 4,116 behavioral crisis runs reported in 1979. The age and sex distribution of behavioral crisis runs is presented in Figure 5. There is little difference between males and females at any age category. Behavioral crisis runs peak in the age range of greater than 65 years old.

The majority of these runs were considered to be minor at the scene (Table 13). Seven percent were determined to be critical at the scene. Patient restraints were utilized in approximately four percent of behavioral runs statewide, as noted in Table 12. There were no reported treatments administered in sixty-four percent of the behavioral runs statewide.

Perinatal

There were 499 perinatal runs reported statewide in 1979. Twenty-two percent of these were determined to be critical at the scene, forty-one percent minor (Table 13). The most commonly reported treatments on perinatal runs were establishing an airway and administering oxygen. A neonatal incubator was utilized in 6.4 percent of perinatal runs – 5.7 percent of metro area high risk infant runs, 8.8 percent non-metro high risk infant runs.

In addition, there were 658 obstetrical runs reported in 1979. The age distribution of these obstetrical runs is presented in Figure 6.

Spinal Cord Injury

There were 1056 cases of suspected spinal cord injury (SCI) reported. It is not possible to determine what proportion of these runs involved an actual SCI due to difficulties in diagnosing SCI in the field. The age and sex distribution of suspected SCI runs is illustrated in Figure 7. A majority of these runs were made for persons less than 40 years old. Thirty-six percent of suspected SCI runs were determined to be minor at the scene (Table 13), an indication that all of the runs falling into this category are not actual spinal cord injuries since all SCI is severe or critical. A spine board was used on 62 percent of all suspected SCI runs and a cervical collar in 56 percent of the runs (Table 12).

Poison

There were 167 poison runs reported in 1979. Twenty-five percent of poison runs were made in the 0-4 year age category (Figure 8), reflecting the age specific incidence rates of non-intentional poisoning. Another thirty-two percent of these runs were made in the 15-19 year age category possibly reflecting the age distribution of intentional overdoses. The distribution of poison runs according to the condition at the scene is presented in Table 13.

Treatment patterns for poison runs varied between metro and non-metro regions. Non-metro regions provided respiratory support more frequently while the Metro region provided IV fluids and medications more frequently (Table 17).

Those poison treatments more commonly administered in the Metro region are treatments which are limited to ALS ambulance services.

Burn

There were 398 burn runs reported. The age and sex distribution of these runs is presented in Figure 9. Males tended to dominate burn runs with 72 percent of all burn runs made on male patients. The twenty to twenty-four year age group had the highest proportion of runs in this category. Seventy-two percent of all burn runs were determined to be urgent or critical at the scene, as illustrated in Table 13.

Respiratory support and irrigation were the most commonly reported treatments among burn runs (Table 12). There was little difference in the pre-hospital care of burn patients between metro and non-metro regions.

General

Thirty percent of all reported runs were made for conditions not falling into one of the seven EMS clinical categories. The distribution of illness types among these general runs is presented in Table 18. Respiratory and abdominal symptoms along with seizures account for 46 percent of these runs. These runs were evenly divided between males and females and had the highest proportion of runs in the greater than 65 year age category (Figure 10). A wide variety of treatments were administered in these runs (Table 12), with treatments associated with ALS services more frequently administered in the Metro region.

TABLE 17

PERCENT OF POISON RUNS FOR WHICH SPECIFIC TYPES OF TREATMENTS WERE ADMINISTERED METRO vs. NON METRO MINNESOTA, 1979

TREATMENT	Percent of Metro Poison Runs	Percent of Non Metro Poison Runs	Percent of All Poison Runs
Establish Airway	8.0	35.7	15.0
Oxygen	45.6	54.8	47.9
Telemetry/ECG Monitoring	19.2	–	14.4
IV Fluids	13.6	2.3	10.8
Medications	4.8	–	3.6

FIGURE 6
PERCENT OF OBSTETRICAL RUNS
BY AGE
MINNESOTA, 1979

FIGURE 7
PERCENT OF SPINAL CORD INJURY RUNS
BY AGE AND SEX
MINNESOTA, 1979

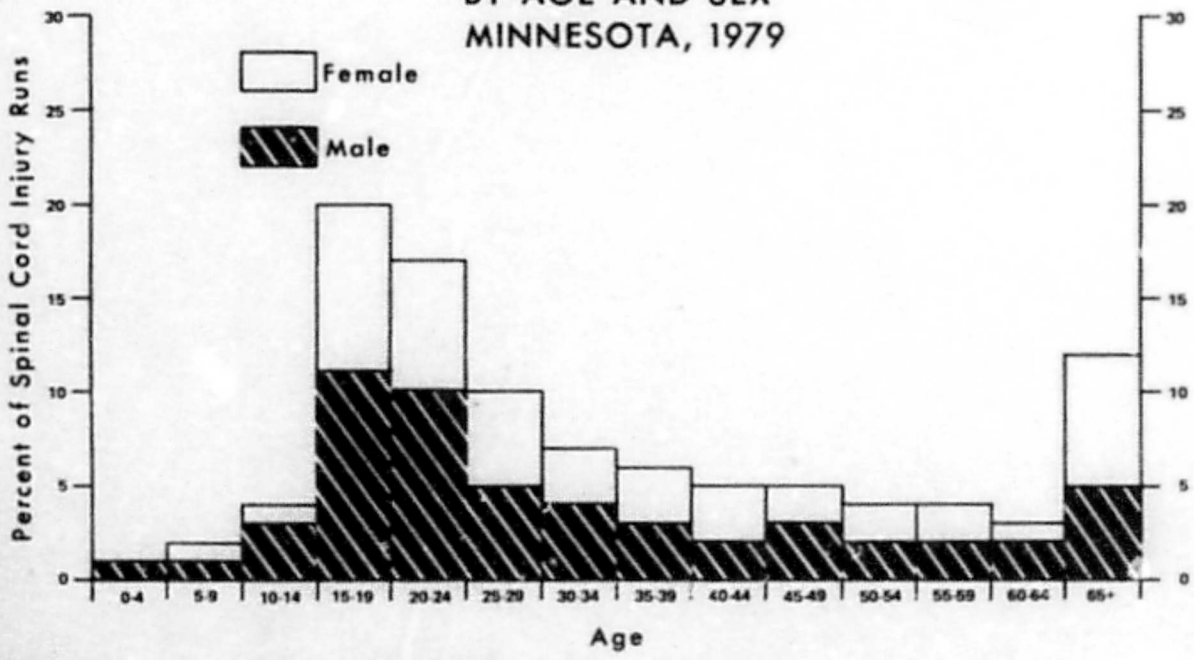


FIGURE 8
PERCENT OF POISON RUNS
BY AGE AND SEX
MINNESOTA, 1979

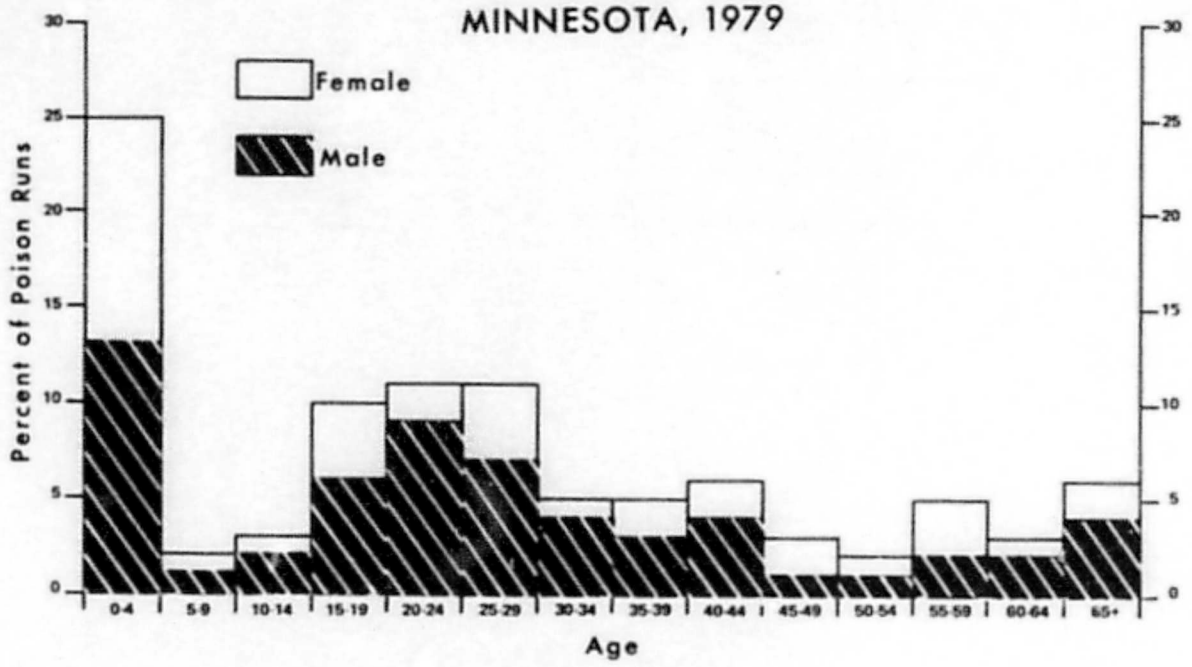


FIGURE 9
PERCENT OF BURN RUNS
BY AGE AND SEX
MINNESOTA, 1979

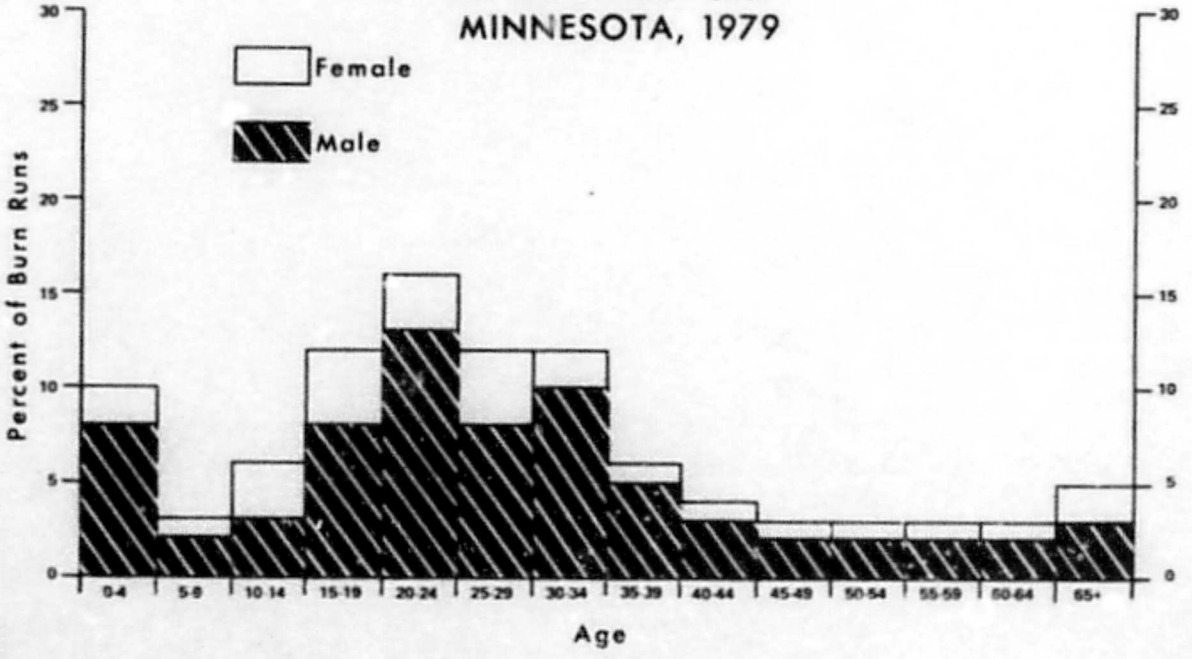


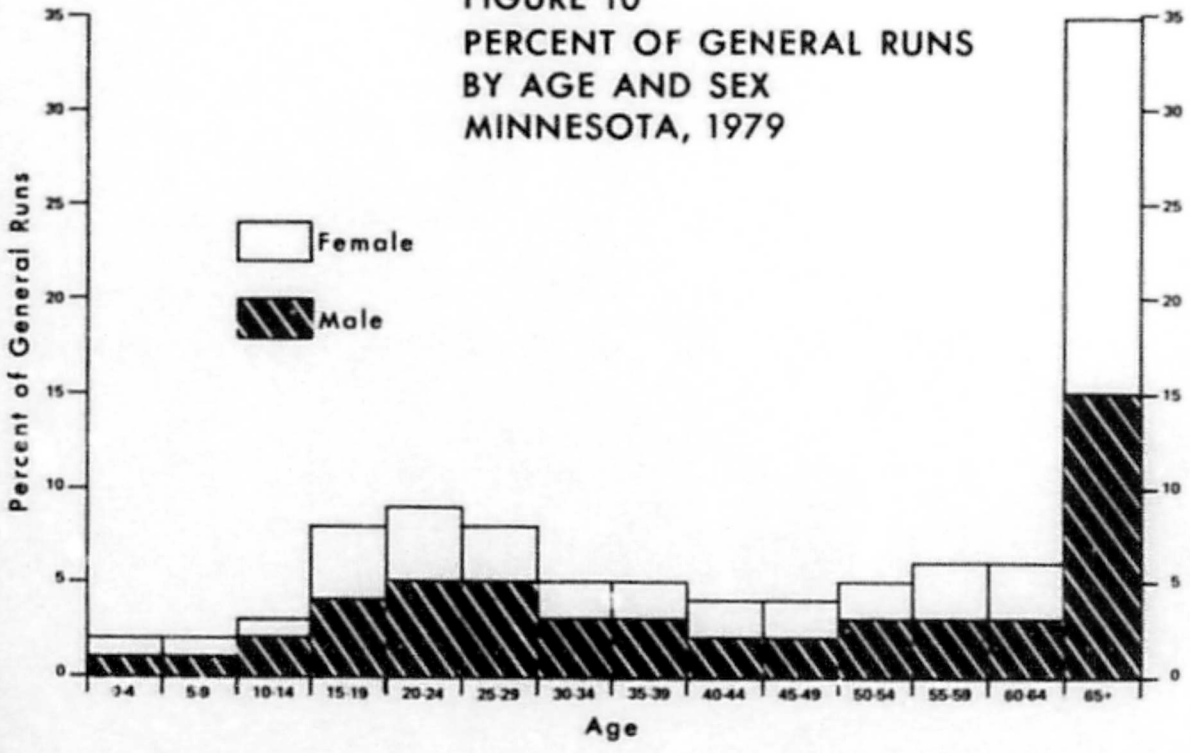
TABLE 18

GENERAL* RUNS BY ILLNESS TYPE
MINNESOTA, 1979

ILLNESS TYPE	Number	Percent
Pain – Unspecified	5,931	35.2
Respiratory Problems	2,999	17.8
Convulsion/Seizure	2,422	14.4
Abdominal Symptoms	2,266	13.5
Diabetic Complications	969	5.8
Nausea/Vomiting	812	4.8
Fever/Chills/Infection	591	3.5
Paralysis	540	3.2
Allergic Reaction	188	1.1
Heat Prostration	117	0.7
TOTAL	16,835	100.0

*"General" refers to those ambulance runs which cannot be categorized by any other EMS clinical category.

FIGURE 10
PERCENT OF GENERAL RUNS
BY AGE AND SEX
MINNESOTA, 1979



MOTOR VEHICLE TRAUMA

A separate section dealing specifically with motor vehicle trauma has been included to demonstrate other potential applications of the ambulance trip form data set. Continued improvement in the quality of data collected in this system will permit more sophisticated analyses to be performed including linkages with other appropriate data sets.

Motor vehicle trauma was defined on the basis of the incident type recorded for trauma runs. Auto/truck, motorcycle and pedestrian runs were used to create a separate category for motor vehicle trauma.

Motor vehicle related trauma accounted for 15 percent of all reported runs in 1979 and 31 percent of all trauma runs. The proportion of all runs due to motor vehicles is probably low due to the large number of unreported (unknown) incident types.

Accident Type

The majority of motor vehicle trauma runs were made for injuries due to automobile and truck accidents (Table 19). Eleven percent were due to motorcycles and 6 percent were pedestrian accidents.

Site and Type of Injury

Tyep of injury is described by site of injury in Table 20. The head was the most commonly occurring site among motor vehicle injuries, comprising 48 percent of all motor vehicle injuries. The extremities accounted for another 27 percent of the total. Contusions were the most commonly reported type of injury, comprising 46 percent of all motor vehicle injuries. Extremity fractures made up 10 percent of the motor vehicle related injuries.

Injury Severity

Forty-nine percent of all motor vehicle injuries were determined to be minor at the scene, statewide (Table 21). Eleven percent were assessed as critical. Non-metropolitan ambulance services encountered a greater proportion of severe injuries than did metropolitan area services. Sixty-four percent of all non-metro motor vehicle injuries were urgent or critical compared to 41 percent of metro area injuries.

Communications

The majority of motor vehicle trauma runs reported radio communications with a hospital enroute (Table 22). Radio medical advice was reported in 10 percent of motor vehicle trauma runs statewide, with little difference between metro and non-metro regions.

Level of Ambulance Service

The distribution of training level/ambulance service level is presented in Table 23, using the same categories as described in the previous section on level of ambulance service. The vast majority of all motor vehicle trauma runs (98%) were made with EMT-A or EMT-P personnel. Two percent were made with ARC personnel statewide, 74 percent of these ARC runs were made in non-metro regions.

Severity Status Changes Enroute

The distribution of severity status changes enroute is presented in Table 24. The majority of motor vehicle trauma runs resulted in no change or an improvement in severity status. Less than 1 percent deteriorated enroute.

TABLE 19

MOTOR VEHICLE TRAUMA RUNS BY TYPE OF ACCIDENT MINNESOTA, 1979

ACCIDENT TYPE	MOTOR VEHICLE TRAUMA RUNS	
	#	%
Auto-Truck	7,098	*82.7*
Motorcycle	936	*10.9*
Pedestrian	547	*6.4*
TOTAL	8,581	*100.0*

TABLE 20

PERCENTAGE* OF TOTAL MOTOR VEHICLE TRAUMA RUNS BY SITE OF INJURY BY TYPE OF INJURY MINNESOTA, 1979

TYPE OF INJURY	SITE OF INJURY								
	Head (Percent)	Neck (Percent)	Back (Percent)	Chest (Percent)	Abdomen (Percent)	Pelvis (Percent)	Upper** Extremity (Percent)	Lower† Extremity (Percent)	Total (Percent)
Open Fracture	0.4	0.1	–	0.0	–	0.0	0.3	1.5	2.4
Closed Fracture	1.3	1.2	0.5	0.9	0.0	0.6	2.8	5.2	12.5
Dislocation	0.0	0.1	0.0	–	0.0	0.0	0.6	0.3	1.1
Sprain	0.1	2.1	0.8	0.1	–	0.1	0.4	0.7	4.3
Amputation	0.1	–	–	–	–	–	0.0	0.1	0.2
Crushing	0.5	0.2	0.1	0.4	0.1	0.1	0.2	0.3	1.9
Open Wound	15.6	0.2	0.2	0.0	0.0	0.0	1.3	1.7	19.0
Penetrating Injury	0.3	–	0.0	0.0	0.0	–	0.0	0.1	0.5
Bleeding	3.5	0.0	0.0	0.0	0.2	–	0.2	0.2	4.1
Contusion	23.1	3.4	3.3	3.5	1.7	0.7	4.1	6.0	45.7
Other	3.0	1.9	1.1	0.7	0.3	0.1	0.7	0.6	8.3
TOTAL	47.8	9.2	6.0	5.8	2.4	1.7	10.7	16.5	100.0

Percentages calculated on the total number of Motor Vehicle Trauma runs, N = 8,581.
**Upper Extremity includes arm, hand, and fingers.*
†Lower Extremity includes leg, foot, and toes.

TABLE 21

MOTOR VEHICLE TRAUMA RUNS BY CONDITION AT SCENE BY EMS REGION MINNESOTA, 1979

EMS REGION	CONDITION AT SCENE									
	Total		Fatal		Critical		Urgent		Minor	
	#	%	#	%	#	%	#	%	#	%
Agassiz	134	*100.0*	5	*3.7*	30	*22.4*	63	*47.0*	36	*26.9*
Arrowhead	786	*100.0*	5	*0.6*	138	*17.6*	357	*45.4*	286	*36.4*
Central	1,040	*100.0*	5	*0.5*	170	*16.3*	455	*43.8*	410	*39.4*
Min-Dak	222	*100.0*	3	*1.4*	26	*11.7*	112	*50.5*	81	*36.5*
South Central	297	*100.0*	2	*0.7*	48	*16.2*	142	*47.8*	105	*35.4*
Southeast	749	*100.0*	3	*0.4*	133	*17.8*	368	*49.1*	245	*32.7*
Southwest	254	*100.0*	4	*1.6*	58	*22.8*	129	*50.8*	63	*24.8*
Non Metro Total	3,482	*100.0*	27	*0.8*	603	*17.3*	1,626	*46.7*	1,226	*35.2*
Metro	5,099	*100.0*	9	*0.2*	377	*7.4*	1,712	*33.6*	3,001	*58.9*
STATE TOTAL	8,581	*100.0*	36	*0.4*	980	*11.4*	3,338	*38.9*	4,227	*49.3*

TABLE 22

PERCENTAGE OF REGIONAL RUNS IN WHICH COMMUNICATIONS WITH HOSPITAL WERE NOTED ENROUTE TO HOSPITAL BY EMS REGION MOTOR VEHICLE TRAUMA ONLY MINNESOTA, 1979

EMS REGION	COMMUNICATIONS		
	Hospital Notified Prior to Arrival (Percent)	Hospital Prepared (Percent)	Radio Medical Advice Enroute (Percent)
Agassiz	94.0	83.6	5.2
Arrowhead	94.0	81.9	10.6
Central	96.5	88.8	5.0
Min-Dak	98.6	95.0	3.6
South Central	91.9	81.5	13.5
Southeast	96.8	92.1	11.1
Southwest	93.7	87.4	7.9
Non Metro Total	*95.5*	*87.4*	*8.4*
Metro	81.0	72.5	10.4
STATE TOTAL	86.9	78.6	9.6

TABLE 23

PERCENTAGE OF REGIONAL RUNS BY TRAINING/AMBULANCE SERVICE LEVEL BY EMS REGION MOTOR VEHICLE TRAUMA ONLY MINNESOTA, 1979

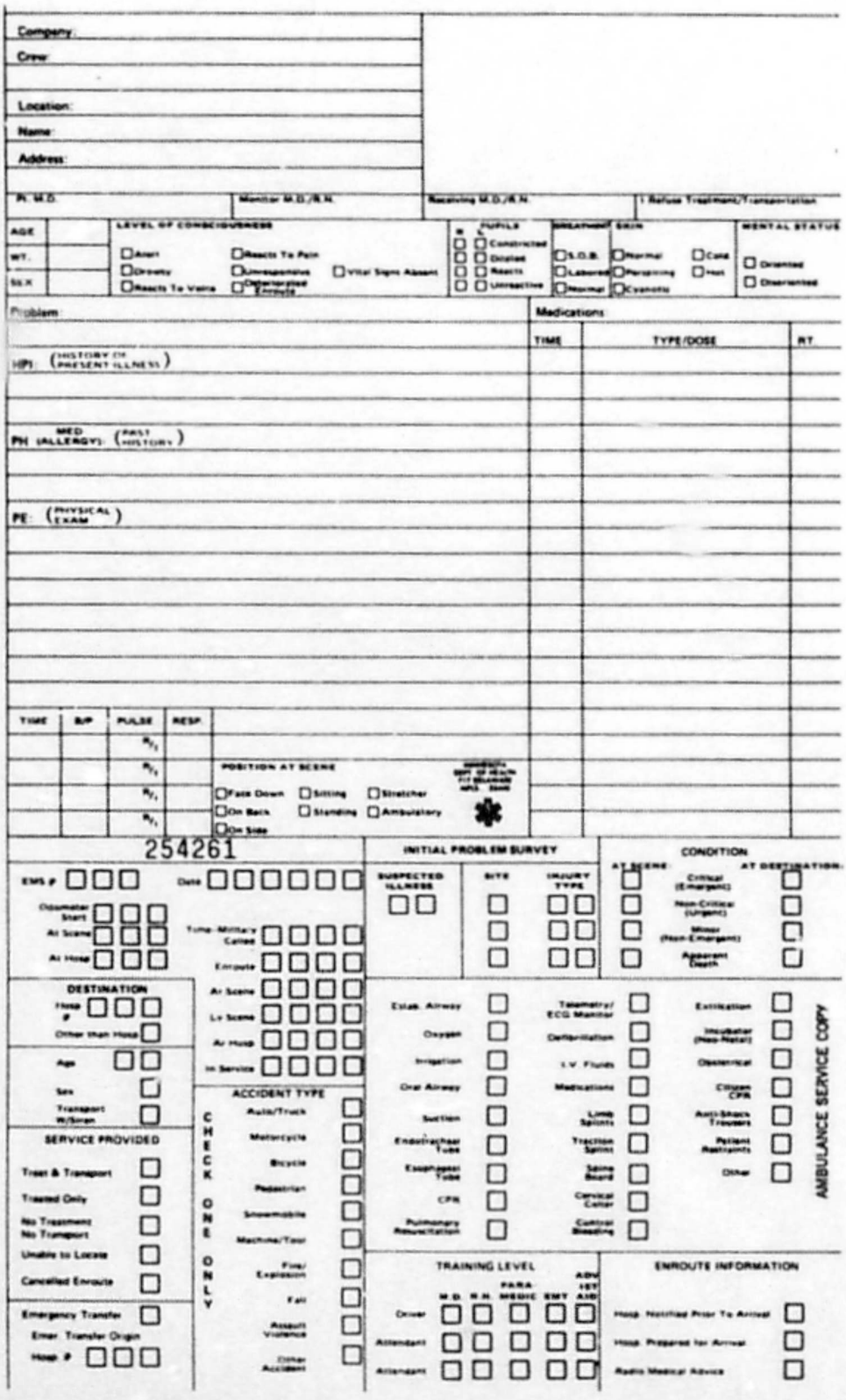
EMS REGION	TRAINING/AMBULANCE SERVICE LEVEL					
	Total (Percent)	ALS (Percent)	BLS/EMT-P (Percent)	BLS/EMT-A (Percent)	BLS/ARC (Percent)	Unknown (Percent)
Agassiz	100.0	–	10.4	82.8	6.7	–
Arrowhead	100.0	31.9	1.7	60.2	6.1	0.1
Central	100.0	–	16.3	80.6	2.8	0.3
Min-Dak	100.0	–	2.3	97.7	–	–
South Central	100.0	–	8.0	81.1	8.1	2.4
Southeast	100.0	24.6	2.9	69.7	2.7	0.1
Southwest	100.0	–	9.1	86.6	4.3	–
Non Metro Total	*100.0*	*12.5*	*7.8*	*75.3*	*4.0*	*0.3*
Metro	100.0	73.7	3.5	21.4	1.0	0.5
STATE TOTAL	100.0	48.9	5.3	43.2	2.2	0.4

TABLE 24

MOTOR VEHICLE TRAUMA RUNS IN WHICH CHANGE IN PATIENT'S CONDITION ENROUTE FROM SCENE TO HOSPITAL WAS NOTED MINNESOTA, 1979

SEVERITY STATUS CHANGES ENROUTE	Number	Percent
No Change	7,841	*91.4*
Improved	496	*5.8*
Deteriorated	45	*0.5*
Unknown	199	*2.3*
TOTAL	8,581	*100.0*

APPENDIX A
MINNESOTA EMERGENCY MEDICAL SERVICE RECORD



INITIAL PROBLEM SURVEY*

ILLNESS CODES (Code only the primary problem)

01 . . . ABDOMINAL SYMPTOMS
02 . . . . ALLERGIC REACTION
03 . . . . RESPIRATORY PROBLEMS
04 . . . . CARDIAC SYMPTOMS
05 . . . . CONVULSIONS/SEIZURE
06 . . . . DIABETIC COMPLICATIONS
07 . . . . FEVER/CHILLS/INFECTION
08 . . . . HEAT PROSTRATION
09 . . . . CONFUSION/ANXIETY/AGITATION
10 . . . . NAUSEA/VOMITING
11 . . . . ALCOHOL ABUSE
12 . . . . DRUG ABUSE/OVERDOSE
13 . . . . OTHER POISONING
14 . . . . PARALYSIS
15 . . . . OB/GYN
16 . . . . PAIN-OTHER
00 . . . . OTHER (DESCRIBE ON TOP OF FORM)

INJURY CODES (Code primary injury in shaded boxes — secondary injuries may be coded if present)

SITE

1 . . . . . HEAD
2 . . . . . UPPER EXTREMITY
3 . . . . . NECK/SPINAL COLUMN
4 . . . . . BACK
5 . . . . . CHEST
6 . . . . . ABDOMEN
7 . . . . . PELVIC REGION
8 . . . . . UPPER LEG – HIP
9 . . . . . KNEE – LOWER LEG – FOOT

TYPE

01 . . . . AMPUTATION
02 . . . . BURN
03 . . . . CONTUSION-BRUISE-BLUNT INJURY
04 . . . . CRUSHING
05 . . . . DISLOCATION
06 . . . . FRACTURE-OPEN
07 . . . . FRACTURE-CLOSED
08 . . . . HEMORRHAGING
09 . . . . OPEN WOUND
10 . . . . SPRAIN – STRAIN
11 . . . . PENETRATING INJURY
00 . . . . OTHER (DESCRIBE ON TOP OF FORM)

*The illness and injury codes are to be filled in based upon the observations of the ambulance drivers/attendants. This is not intended to be a medical diagnosis.

APPENDIX B
HSA AND EMS SYSTEM REGIONS IN MINNESOTA