EXTRACT FROM AGENDA FOR THE MEETING OF THE MERSEY RHA HELD ON 22 FEBRUARY 1983

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MERSEY REGIONAL HEALTH AUTHORITY

MERSEY REGIONAL BLOOD TRANSFUSION SERVICE

REPORT OF THE DIRECTOR

Mersey Regional Blood Transfusion Service

Introduction

The Mersey Regional Blood Transfusion Centre provides full services to a total population of approximately 2.8 million and a limited service to the Isle of Man.

The geographical boundaries are not identical to those of the Regional Health Authority but the greater portion of the region is covered.

The catchment areas and populations are as follows:-

A.	Mersey Region	
	D.H.As except Macclesfield (175,100) and Crewe (241,900).	2041,100
B.	North Wales	
	Clwyd	386,500
	Gwynedd	226,700
	Powys (Part)	12,000
C.	North Western Region	
	Ormskirk	97,000

Within these boundaries the B.T.S. is solely responsible for the supply of whole blood and certain blood products to all N.H.S. hospitals. The unit works closely with the consultant haemotologists in the various hospitals through whom blood is requested and issued for use. Blood stocks are maintained both peripherally within hospital pathology departments and centrally in the B.T.S. Unit store at a level designed to meet all normal and emergency demands. Contingency plans exist to deal with major disasters by co-operation between adjacent centres.

During the decade 1970-80 the demand from hospitals for blood increased steadily for the first 5 years but then slowed and almost reached a plateau by 1979-80. This is in line with the national trend and suggests that the future demand for blood and certain derivatives such as packed cells and platelets will increase at a relatively slow rate.

The demand for Plasma products such as Albumin or Factor VIII on the other hand has increased sharply during the last few years and present projections indicate that this situation will continue throughout the next decade. This report is primarily concerned with the effect that these changes will have on the operation of the B.T.S. during the next decade.

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The transfusion centre is accommodated in a purpose designed building situated in West Derby Street, which was opened in 1969. The unit is self contained and includes a donor suite, laboratory facilities, a blood processing unit, central blood stores, transport department etc. together with appropriate administrative support services.

A total of 214 staff are employed consisting of 3 full time Medical Consultants (including the Director) 7 W.T.E. sessional medical officers, 77 laboratory and technical staff, 56 engaged on blood collection (mobile teams) 24 drivers etc., 28 in the Donor Organisers department and 19 Administration and ancilliary staff.

Blood is donated on a voluntary basis by members of the public at collecting sessions held either in the transfusion centre or in a wide variety of sites within the catchment area. Mobile Teams typically consisting of a Session Manager (S.R.N.) 7 Donor Attendants, 1 clerk and 2 Driver/Technicians are responsible for running these sessions and delivering blood to the centre for grouping and processing.

In order to meet the present level of demand from hospitals for whole blood and locally manufactured blood products an intake of approximately 2500 units per week i.e. 500 units per day, is required. A full day session using 10 fully staffed beds should yield about 100 units but the average figures recently have been significantly lower than this for reasons which are discussed later in this report. Responsibility for recruiting new donors, maintaining the donor panel and calling out donors to attend giving sessions lies mainly with the Regional Donor Organiser although valuable assistance is obtained at certain venues from voluntary workers such as the Red Cross.

Management Arrangements

The B.T.S. forms part of a national network of transfusion centres which are co-ordinated through the D.H.S.S. B.T.S. Advisory Committee. This body, membership of which includes a Regional Medical Officer, Treasurer and Administrator, is also responsible for formulating national policy for the transfusion centres and for the Blood Products Manufacturing Unit at Elstree.

Local Management and funding of the B.T.S. Centres is the direct responsibility of the R.H.A.

In the Liverpool Unit the Medical Director, who is accountable to the R.H.A. for all activities within the centre, leads a unit management team consisting of the heads of the four main departments, namely, Administration, Laboratory Services, Donor Organisation and Collecting Teams. Specialist Regional Officers attend team meetings by invitation and are available to provide support and advice as required. In view of the changes presently taking place within the B.T.S. the Region has set up a standing work group which is responsible for formulating and implementing strategy and policy. Appendix 'A' shows the interelationship of these bodies.

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Present Situation

Although the centre, except during periods of industrial action, has been able to maintain adequate stocks of whole blood etc. to meet all medical and surgical demands, it has become apparent during the past few years that the situation is potentially unstable in the short term and is incapable of expanding to meet future demands without major changes being introduced.

The most acute problem centres on the organisation and call out of donors which has resulted in many lost sessions and poor average yields.

Several factors have contributed to this situation, one of which is illustrated in Appendix B. This tabulates the effect of the economic recession on donor availability from some industrial sites.

Other important factors include difficulties in maintaining accurate data on the donor panels, which total more than 100,000, changing public and staff attitudes toward facilities available at session sites, many of which are now not considered to be acceptable, and increased union activity in relation to technical and procedural advances.

In other departments such as the laboratory, blood processing and storage, or administration, the problems are less acute although it is clear that they are also approaching saturation level.

Blood Products

Traditionally the blood transfusion service existed to collect, group and distribute whole blood to hospitals where it was used to treat blood loss arising from surgery, trauma, bleeding ulcers etc, or anaemia associated with various medical conditions. As haematology has developed as a speciality more specific transfusions using fractionated blood products such as packed red cells, platelet and white cell concentrates, frozen fresh plasma, etc. have become increasingly common and now represent a significant proportion of the B.T.S. workload.

These products are prepared on site by the transfusion centre and distributed to hospitals in response to demand in the normal way. They cannot be obtained from any other sources.

Other products, derived from blood plasma are obtained either from commercial firms or from the N.H.S. Blood Products Laboratory situated at Elstree (B.P.L.).

The raw material used by this unit i.e. plasma is collected by all the B.T.S. centres each of which receives plasma products for use within its catchment area pro-rata for the amount of plasma delivered to the B.P.L. The two most important products are P.P.F. (Albumin) which is extensively used in intensive care units, burns units, renal units, etc. and Factor VIII which has greatly improved the treatment of patients with haemophilia.

Other important plasma derivatives are the Hyperimmune Human Immunoglobulins such as Anti-D used in the treatment of Rhesus disease of the newborn.

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Fortunately P.P.F. can be obtained from the same plasma as Factor VIII as well as plasma taken from outdated whole blood. Apart therefore from specific high titre immunoglobulins which are required in relatively small quantities the Factor VIII requirement should cover other plasma components.

For some time self sufficiency in blood and blood products free from any commercial persusasion has been widely advocated (W.H.O. ISBT Code of Ethics etc.) and it is now N.H.S. policy to move towards full self sufficiency during the present decade. Apart from ethical considerations the cost to this region of continuing to obtain these products i.e. Albumin and Factor VIII from commercial sources would be substantial. This is illustrated by Appendix C, which lists drug purchases for one hospital in cost order. As can be seen Albumin is top of the list and represents 6.5% of the total drug bill.

For the region as a whole the figure exceeds £200,000 p.a. The B.T.S. at present supplies less than 20% of the Factor VIII demand, the remainder costing some £150,000 p.a.

The proposed expansion of N.H.S. production at B.P.L. is to take place in two phases.

Phase 1

Improvements at the B.P.L. which have now been completed will increase the present production capacity of 15 million units per annum to 30 million units by mid 1983.

Phase 2

The ultimate target figure is 90 million units which will require a new production laboratory. This is expected to be completed towards the end of the present decade.

In regional terms, if we are to take up our share of the increased capacity, these figures imply a need to increase our present targets for blood and plasma collection in the short term by about 50% and to achieve the projected 90 million units per year we would need to contribute plasma from 120,000 donations per year i.e. an extra 80,000 donations above our present programme.

A further implication of these figures arises from the very modest future increase in the need for red cells. To obtain the plasma requirements on the basis of whole blood collection would be both impractical and unethical. Fortunately plasma can be obtained by a technique known as plasmopherenis in which only the plasma is removed, the red cells being returned to the donor. This process, which is already used on a small scale to obtain hyperimmune plasmas such as Anti-D, etc. has the additional advantage that donations can be taken 4 or more times a year compared with twice for whole blood donations so that the size of the donor panel is reduced. Nevertheless to maintain a programme at the above level would require a panel about twice our present size.

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Plasmapheresis can be carried out manually but this technique has a number of problems associated with it such as the need for continuous supervision, the relatively long time taken to complete the procedure, and the need for temperature controlled centrifuges.

Automated plasmapheresis allows 500mls of plasma to be separated in about 30 minutes with minimum supervision. Several machines have been developed for this purpose of which the Hemonetics Model 50 is considered to be particularly suitable and is already being evaluated in other B.T.S. centres. These machines are relatively costly (approximately £25,000) to buy and to run since the disposable tube kits are expensive. It seems probable however that these prices will fall as automated plasmapheresis becomes more widely used.

Since experience with these machines is very limited it is difficult to quantify our needs in terms of meeting phase 1 or phase 2 targets. However present estimates suggest that 4 - 6 machines will be required during the next 2 years with an eventual expansion to 25 - 30 machines and 30 - 40 beds dedicated to plasmapheresis if we are to meet our phase 2 target figures.

Cost estimates for the projected expansion up to 1985 are contained in Appendix 'D'.

Progress to Date

A number of measures have already been taken to improve the efficiency of the present B.T.S. These include a strengthened and revised managerial system, the appointment of qualified nurses (S.R.N.) as session managers, bonus schemes for driver/technicians, increased staff in the donor organiser's department and the purchase of a fully automatic blood grouping system with bar code read out.

An O & M Study of the administrative services is due to start soon and a detailed statistical analysis of data relating to collecting sessions has been arranged in order to identify the causes of the recent drop in session yields.

A preliminary assessment of the benefits to be obtained from computerising the donor panel maintenance and call out procedures suggests that significant gains could be achieved although there are major difficulties over the data entry required to set up the system. An evaluation of systems already in use in the West Midlands and Manchester is under way.

There is strong evidence from other B.T.S. centres that a permanent transfusion unit in the midst of a large city can not only yield excellent results in terms of collecting donations, but is invaluable as an information, publicity and recruiting centre.

Work is now well advanced on the adaptation of a ground floor site in the centre of Liverpool which will include facilities for plasma pheresis using Hemonetics machines.

A 2 station plasma pheresis unit at the B.T.S. Centre will also be set up during 1983-84.

A number of technical improvements in blood packs and collection methods will also help to increase both the quality and quantify of frozen plasma for delivery to the Blood Products Laboratory.

A summary of recent production figures for the B.T.S. is attached (Appendix 'E').

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Summary and Recommendations

The Blood Transfusion Service is at present undergoing a period of relatively rapid evolution as a result of national policy decisions and external factors over which it has little control.

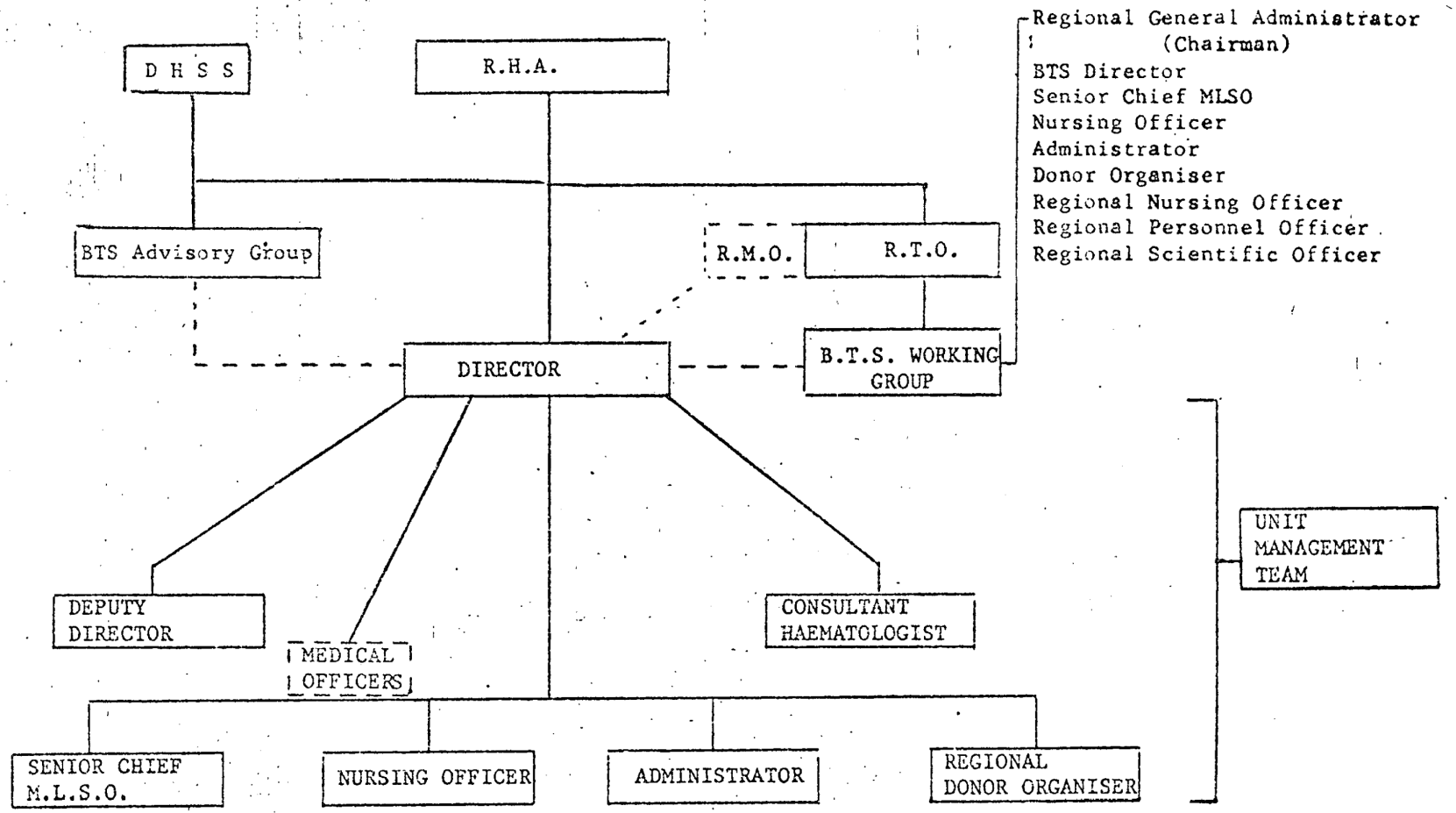
Measures already taken or which are in hand will allow it to meet short term targets for whole blood and blood products but further expansion is dependant upon the availability of capital and revenue. Failure to expand will face District Health Authorities with the difficult decision of either having to spend large sums of money to obtain blood products from commercial firms or to accept the restrictions on clinical activity which would result from the non-availability of these products.

It is recommended that the short term measures listed in this report should be completed as a matter of urgency and that approval is given in principle to further measures which will allow the B.T.S. to move towards full self sufficiency for blood products by the end of the present decade.

AGE/TMR/KR
15/2/83
MEDREP 83/23A

Appendix A

MERSEY REGIONAL HEALTH AUTHORITY
REGIONAL BLOOD TRANSFUSION SERVICE
ORGANISATIONAL STRUCTURE



Appendix 'B'

ECONOMIC RECESSION AND EFFECT ON INDUSTRIAL BLOOD DONOR SESSIONS SINCE 1978

	TOTAL 1978 FIGURE	TOTAL NO. DAYS SESSIONS	PRESENT DAY FIGURE	NO. OF DAYS	TOTAL DONORS LOST	TOTAL DAYS LOST
GROUP 1	6644	69	Nil	Nil	6644	69
GROUP 2	3146	36	Nil	Nil	2'500 approx	36
GROUP 3	14,657	132	9673	113	4984	19
GROUP 4	9327	79	5654	63	3673	16
TOTALS	34,674	316	15,327	176	18,557	140

GROUP 1 - INDUSTRY CLOSED.LOST SITE & DONORS

GROUP 2 - LOST SITE & SOME DONORS. Some donors go to Public Sessions

GROUP 3 - FIRMS WE STILL VISIT BUT DONOR NUMBERS REDUCED.

GROUP 4 - INDUSTRIAL ESTATES "COMPOSITE" Sessions numbers of donors reduced.

1 "DAY" is equivalent to two sessions

Appendix C

MERSEY REGIONAL HEALTH AUTHORITY

WALTON HOSPITAL — STOCK VALUATION - TOP 37 VALUES - COST — DATE 25/08/82

Catalogue Number	Name and Strength	Form	Pack Size	Issues Y-T-D	Unit Price	Value
791	Albumin, Human Injection 20%	INJ	100ML	643	25.50	16 396.50
8527	Chlorhexidine B/Wash 0.02% 1L	SOL	12	1110	12.12	13 453.20
12779	Dextrose Injection 5% 500ML	IVI	12	1550	8.40	13 020.00
41031	Sodium Chloride Inj 0.9% 500ML	IVI	12	1426	7.80	11 122.80
28321	Metronidazole I/V Inf 500MG (Flagyl)	INJ	100ML	2185	3.60	7 866.00
20481	Human Tetanus Immunoglobulin 250U	INJ	1ML		13.00	
47381	Water Non-Injectable Sterile 1L	SOL	1	5900	0.78	4 602.00
16961	Flucloxacillin Inj 500MG (Floxapen)	INJ	10	282	15.94	4 495.08
1421	Amikacin Inj 500MG/2ML (Amikin)	INJ	5	118	34.99	4 128.82
20106	Heparin Inj 5000U/0.2ML (Uniparin)	INJ	50	187	21.00	3 927.00
8421	Chlorhexidine Scrub 4 (Hibiscrub)	SOL	500ML	1798	2.10	3 775.80
7701	Cephradine Caps 500MB (Velobef)	CAP	100	179	20.23	3 621.17
22138	Industrial Methylated Spirit 96%	SOL	2500L	4	899.80	3 599.20
16891	Flucloxacillin Caps 250MG (Floxapen)	CAP	500	40	89.90	3 596.00
821	Alcuronium Chloride Inj 20MG/2ML	INJ	10	733	4.58	3 357.14
7751	Cephradine Injection 1G (Velosef)	INJ	1	1720	1.95	3 354.00
7361	Cefuroxime Inj 750MG (Zinacef)	INJ	5	226	14.70	3 322.20
9721	Cimetidine Tablets 200MG (Tabamet)	TAB	500	50	59.90	2 995.00
23351	Isocal	SOL	237ML	5571	0.53	2 952.63
18861	Gentamicin Inj 80MG/2ML (Garamycin)	INJ	5	386	7.38	2 848.68
9861	Clearsol Sachets	SAC	50ML	17603	0.16	2 816.48
30931	Noxythiolin 2.5G + Amethocain PDR	POW	10	64	41.05	2 627.20
19981	Halothane (Fluothane)	SOL	250ML	459	5.58	2 561.22
35072	Piperacillin Inj 2G (Pipril)	INJ	1	566	4.33	2 450.78
44121	Thiopentone Sod 2.5G + Water 100ML	INJ	5	121	20.20	2 444.20
6541	Calcium Folinate Tablets 15MG	TAB	10	42	52.65	2 211.30
16118	Etoposide Caps 100MG (Vepesid)	CAP	10	22	99.57	2 190.54
19762	Haemaccel Injection	INJ	500ML	728	2.95	2 147.60
19462	Glygine Bladder Irrigation 1.5% 3L	SOL	1	1058	2.03	2 147.74
2301	Ampicillin Inj 500MG (Penbritin)	INJ	10	320	6.39	2 044.80
14881	Doxorubicin Inj 50MG (Adriamycin)	INJ	1	49	41.70	2 043.30
7311	Cefotaxime Injection 1G (Claforan)	INJ	1	459	4.44	2 037.96
35590	Pot Chlor 0.3% + Dextrose Inj 500ML	IVI	1	2208	0.90	1 987.20
47281	Water for Injections 10ML	INJ	10	2351	00.84	1 974.84
7741	Cephradine Inj 500MG (Velosef)	INJ	5	392	4.97	1 948.24
39071	Ranitidine Tablets 150MG (Zantac)	TAB	60	111	17.33	1 923.63
34501	Phenytoin Sodium Inj 250MG/5ML	INJ	10	81	23.71	1 920.51

Appendix D

MERSEY REGIONAL HEALTH AUTHORITY

B.T.S. Report

Rev. Costs (at Nov. 82 p & p)	1983/84	1984/85	Total
	£	£	£
Permanent City Donor Centre	33,670	69,720	103,390
Development of Plasmaphersesis	31,200	106,950	138,150
Computerisation of Donor Records	7,200	3,300	10,500
O. & M./Work Study Statistical Analysis Costs	34,000	-	34,000
	106,070	17,990	286,040
Recurring Costs	54,870	159,170	214,040
Non-Recurring Costs	51,200	20,800	72,000
	106,070	179,970	286,040

Capital Costs	1982/83	1983/84	1984/85	Total
	£	£	£	£
Machines for Plasmaphersesis - £25,000 each	2 50,000	2 50,000		100,000
Computer Equipment for Donor Organisation			20,000	20,000

BLOOD PRODUCTS LABORATORY - LIVERPOOL

Appendix 'E'

	1978	1979	1980	1981	1982
5 LITRE PLASMA POOLS SENT TO ELSTREE					
TE	981	852	784	621	456
FF	337	298	476	1187	864
CS	185	345	375	296	220
TOTAL VOLUME PLASMA SEPARATED (LITRES)	7515	7475	8175	10520	11340
DONATIONS TIME EXPIRED BLOOD POOLED	16463	12254	9343	5515	4409
DONATIONS FRESH FROZEN POOLED	12132	9536	14280	31518	43542
DONATIONS CRYOSUPERNATANT POOLED	6660	12420	13500	8729	6233
DONATIONS 'X' POOLED	11505	11668	10619	10682	7125
TOTAL DONATIONS NON-TE POOLED	30297	33624	38399	50929	56900
DONATIONS TIME EXPIRED FROM I.O.M.	1016	985	1373	1331	1560
PLATELET CONCENTRATES PREPARED	13375	13719	13442	13808	18720
ISSUED	8916	9850	9303	11413	15197
% ISSUED	66.6	71.8	69.2	82.7	81.2
CYROPRECIPITATE PREPARED	21347	23020	22662	13607	6872
"LOSSES IN PRODUCTION"	1907	1566	1240	1512	551
STOCK PREPARED	19440	21454	21422	12095	6321
ISSUED TO HAEMOPHILIA CENTRES	12227	14579	16355	7817	3105
ISSUED TO OTHER HOSPITALS	8010	6893	6648	4514	3272
TOTAL ISSUED	20237	21472	23003	12331	6377
FRESH FROZEN PLASMA PREPARED	4775	4830	5712	6494	6837
"LOSSES IN PRODUCTION"	79	114	127	164	206
STOCK PREPARED	4696	4716	5585	6330	6631
ISSUED TO HAEMOPHILIA CENTRES	410	881	879	1093	1299
ISSUED TO OTHER HOSPITALS	4304	3808	4713	5237	5213
TOTAL ISSUED	4714	4689	5592	6330	6512
SPECIFIC PLASMAS ANTI-TETANUS	600	903	1092	746	786
POST VACCINA	167	97	52	26	5
OTHER SPECIFIC	249	140	164	83	83