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Sourcing of blood from donors born after 1st January 1996

1. Executive summary

There have been four transmissions of variant Creutzfeldt Jakob disease (vCJD) associated with red cell transfusion, and modelling suggests that more transmissions will occur over a period of decades. In December 2012, SaBTO agreed that the evidence did not currently support the introduction of prion reduction technology to treat red cells. There is no validated screening test for vCJD infection in blood donors.

A range of risk reduction measures is in place to minimise the potential risk of vCJD transmission. One such strategy being explored is optimising the use of donations from people born on or after 1st January 1996, who are assumed to have been largely protected from exposure to vCJD through diet, and who are becoming eligible to donate blood as they reach 17 years of age, from 1st January 2013 onwards.

A Working Group of the UK Blood Services (with Department of Health analysts) has developed an operational plan for directing donations from this donor cohort ('Club 96') to groups of patients also born after 1st January 1996 and hence with low risk of exposure to vCJD through diet.

Following discussion at SaBTO (10 Dec 2012), it was agreed that provision of components to the youngest recipients (intrauterine transfusions, neonatal transfusions) would be a logical first objective, followed by gradual provision to all recipients born after 1st January 1996. Modelling indicates that supply for neonates (28 days old) could be fully met within 3-4 years, but reliably meeting demand for all recipients to be protected may take until 2025.

Operational plans have been developed, along with a communications plan for current and potential donors, staff and stakeholders. Market research has been performed to gain a greater understanding of young people and to increase their recruitment and retention as blood donors. The operational plans could be activated by Blood Services within a few weeks of a decision to proceed.

However a number of concerns were raised over potential virological hazards represented by these young donors in particular relating to beta- and gamma-herpes virus acute infections. Concerns have been expressed over B19 parvovirus. The possibility that this policy may increase the risk of certain viruses being transmitted to the vulnerable neonatal population warrants investigation.

It is possible that the incidence of plasma viraemia of cytomegalovirus (CMV) and Epstein-Barr (EBV) herpes viruses and B19 parvovirus may be higher in the Club 96 young adult donor cohort than in the general unselected donor population, due to the rate of acquisition of these infections in the late teenage years. Although donations directed to neonates are currently tested for CMV, this is for antibody only and not for viral DNA. Neither EBV nor B19 testing is currently performed on donations for any recipient groups. Opinions from neonatologists suggest that intrauterine/neonatal EBV infection is not currently considered a significant clinical concern, though a specialist opinion is rarely sought. Intrauterine B19 can have serious consequences. Leucodepletion will not influence the infectivity of plasma cell free infectivity.

While neonatologists frequently test for CMV, as there are known significant morbidities that may be associated with perinatal CMV infection, they do not routinely test for EBV or B19. Nonetheless, it is possible that EBV could cause pathology in neonates that have not yet

been recognised as being due to this particular viral infection. Testing for B19 is reserved for exposure following maternal infection in pregnancy and neonatal presentation with severe anaemia and heart failure.

A literature review has revealed a paucity of data on the frequency of cell free viraemia for CMV, EBV and B19 according to age. Therefore, it is proposed to conduct a study, hosted in the joint Public Health England /NHS Blood and Transplant (NHSBT) Blood Borne Virus Unit, Colindale, to establish both the prevalence of antibody, and thus susceptibility in the donor population, and the frequency of cell free plasma viraemia, using archived samples held by NHSBT. Funding in part has been approved by the UK Blood Services. It is estimated that this study will take 9-12 months to complete and is planned to commence in the second half of 2013-14 (after the current hepatitis E virus (HEV) study is completed).

Therefore, a decision from SaBTO is requested regarding whether implementation of the Club 96 operational plan should be delayed until the study is completed, and a risk assessment performed.

This would delay provision of Club 96 blood for intrauterine transfusions by at least 12 months.

Note: some details eg from incomplete and/or unpublished research have been removed from this paper.

2. Risk of vCJD from transfusion

There have been four transmissions of vCJD by blood transfusion. There is no screening test for blood donors, and a study of stored appendix samples reports a prevalence of approximately 1 in 2,000 of abnormal prion protein[1]. The prevalence of blood infectivity is unknown. A number of risk reduction measures are in place (eg universal leucodepletion, deferral of transfused individuals, importation of plasma for children, collection of 80% of platelets by apheresis); the risk of future infections remains uncertain.

The latest modelling from the Department of Health (DH) suggests that there might be 160 future transmissions (range 30 – 460) of vCJD by red cell transfusion, and 45 future transmissions (10 – 120) from fresh frozen plasma over the next 65 years if no mitigating action is taken[2]. Like all prion diseases, vCJD is progressive, currently untreatable and ultimately fatal[3]. Transfused babies who survive the neonatal period have a high probability of long survival and hence susceptibility to the clinical effects of prion infection, if present in transfusions.

3. Options to reduce the potential risk of vCJD transmission

3.1. Processing of components

Leucocyte reduction has been in place for all components since 1999. Manufacturers have been developing filters for the removal of prions from red cell concentrates (RCC), and one CE marked filter has been studied extensively. SaBTO considered the evidence currently available at its meeting in December 2012, and decided not to recommend the introduction of this technology to treat red cells for patients born on or after 1st January 1996.

There is no current process for removing prions from platelet concentrates. The current risk reduction strategy is to collect at least 80% of platelets by apheresis (ie from a single donor each time) as an alternative to platelets derived from whole blood donations (which are pooled from four donors). This approach was recommended by SaBTO in 2009, on the basis of reduced assumptions regarding infectivity of blood.

3.2. Sourcing of donations from low risk populations

3.2.1. **Importation**

Plasma is imported from countries with low prevalence of vCJD for patients born after 1st January 1996 and those with thrombotic thrombocytopaenic purpura (TTP), who receive large numbers of units. SaBTO reviewed the importation of plasma as a vCJD risk reduction measure in 2012, and confirmed this position (whilst rescinding a previous recommendation to extend importation for all recipients).

SaBTO has previously considered the option to import red cells for this (and other) patient groups, and did not recommend importation.

3.2.2. **UK donors born after 1st January 1996**

UK residents born after 1st January 1996 are considered to be at lower risk of vCJD infection than older people, due to the implementation of measures to prevent bovine spongiform encephalopathy (BSE) entering the food chain. From 1st January 2013

individuals in this birth cohort began to turn 17 years of age, and thus became eligible to donate blood. The working assumption is that their blood may provide an alternative, lower vCJD risk source of red cells, platelets and plasma.

In order to investigate the feasibility of using this source of donations to supply components to appropriate recipients, and to develop operational plans for recruitment of donors, a Working Group was established by the UK Blood Services.

4. Approach to use of 'Club 96' donors

There were five main areas considered by the group:

1. Assessing the risk of viral infections from Club 96 donors
2. Prioritisation of recipient groups
3. Modelling of supply versus demand
4. Operational issues
5. Market research (recruitment and retention of young donors).

Each of these areas is outlined below.

4.1. Assessing the risk of viral infections from Club 96 donors

4.1.1. Young donors versus older donors

The working assumption (discussed above) is that this cohort of donors poses a lower risk of transmitting vCJD infection through donated blood. However, it is possible that younger donors may have a higher incidence of other infections than older donors. Whilst donations from this age group are currently used in the general blood supply for all recipients, if donations from this cohort are to be used to enrich the supply for young recipients, it is important to ensure that no other risks are inadvertently being introduced. Premature and other neonates are a group who may be particularly susceptible to either acquiring certain viral infections, or having particularly severe clinical consequences.

4.1.1.1. HIV, HCV, HBV.

Table 1 shows the number of donors in the relevant age bands who attended in 2010-2011. Donors aged 17-20 years comprised 26.3% of all new donors and 4.2% of repeat donors during 2010-2011 as compared to 21-24 year olds who comprised 13.2% and 6% respectively.

Table 1. Number of new and returning male and female donors, England Jan 2010-Dec 2011

England Jan 2010–Dec 2011				
age group	**new male**	**repeat male**	**new female**	**repeat female**
17-20 yrs	40,098	32,356	51,581	43,720
21-24 yrs	19,394	42,244	26,518	66,090

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Markers of infection for hepatitis B, C and HIV are reported in Tables 2-4 for the period January 2010 to December 2011. These data report both chronic and acute infections in new and repeat donors. As expected, numbers and rates of infection are higher in first time donors, reflecting previously undetected prevalent infections which the donor may have had for many years.

Occasionally acute infections are detected in new donors. For HBV, these can be defined on the basis of markers. However, for HCV and HIV, it is much more difficult to define an acute infection in a new donor unless detection is by RNA only or there is a good history reported. During 2011 four acute HBV infections were identified in UK blood donors - one late acute infection in a new donor and three seroconversions in donors who had donated in the previous three years.

During 2010-2011 the rates of infection in all donors were low. The rate of HIV infection in repeat donors was higher than for other infections and highest in young male repeat donors, although the numbers were still low. Infections detected in repeat donors usually reflect 'high-risk' behaviours in the inter-donation interval.

Table 2. Number and rate (per 100,000 donations) of HBV in donations from new and repeat donors in England by age group, donor type and gender, 2010-2011.

Hepatitis B virus (HBsAg/ HBV DNA)								
	New male		**New female**		**Repeat male**		**Repeat female**	
Age group	No.	Rate	No.	Rate	No.	Rate	No.	Rate
17-20		17.57		11.71		0.00		0.00
21-24		67.47		15.18		0.00		0.73
25-34		121.18		15.81		0.00		0.00
35-44		119.10		24.90		0.55		0.23
>44		45.53		24.82		0.20		0.00
TOTAL		**71.61**		**18.02**		**0.23**		**0.10**

Table 3. Number and rate (per 100,000 donations) of HCV in donations from new and repeat donors in England by age group, donor type and gender, 2010-2011.

Hepatitis C virus (HCV Ab/HCV RNA)								
	New male		**New female**		**Repeat male**		**Repeat female**	
Age group	No.	Rate	No.	Rate	No.	Rate	No.	Rate
17-20		15.06		5.85		0.00		1.11
21-24		31.14		11.39		1.15		0.00
25-34		56.36		24.85		0.45		0.63
35-44		89.33		13.83		0.82		0.23
>44		97.57		46.88		0.00		0.41
TOTAL		**56.5**		**20.08**		**0.28**		**0.41**

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Table 4. Number and rate (per 100,000 donations) of HIV in donations from new and repeat donors in England by age group, donor type and gender, 2010-2011.

HIV (HIV Ab/Ag; HIVRNA)								
	New male		New female		Repeat male		Repeat female	
Age group	No.	Rate	No.	Rate	No.	Rate	No.	Rate
17-20		0.00		0.00		3.00		0.00
21-24		10.38		0.00		4.59		0.00
25-34		5.64		0.00		1.36		0.31
35-44		11.17		2.77		0.82		0.23
>44		16.26		2.76		0.29		0.20
TOTAL		**7.88**		**1.03**		**0.85**		**0.20**

4.1.1.2. HERPES VIRUSES (CMV, EBV) AND PARVOVIRUS B19

There is a lack of data on prevalence of CMV and EBV viraemia in teenagers, but published data show that transmission of EBV through social contact peaks in late teenage years and early adulthood. Data is available through NHSBT of the incidence of EBV and CMV in deceased organ donors in the UK. The data on EBV, though numbers are small, show an increase in the proportion of reactive EBV tests from 41.67 to 83.87 between the ages of 16-25. The data on CMV shows a gradual increase over time in the proportion of reactive tests with a peak in the 76-80 years age bracket.

Table 5. CMV among deceased organ donors 2008-2012

CMV among deceased organ donors 2008-2012						
AgeQuin	Negative	Reactive	Awaited	Not tested	Unknown	Proportion reactive
0-5	23	24			1	51.06
6-10	14	12			5	46.15
11-15	53	20	2		5	27.40
16-20	153	83	2		10	35.17
21-25	113	87	2	1	4	43.50
26-30	134	82	5		2	37.96
31-35	141	91	2		2	39.22
36-40	219	141	5		3	39.17
41-45	275	201	7	4	1	42.23
46-50	344	228	10	1	2	39.86
51-55	276	317	17	3	5	53.46
56-60	250	314	9	1	0	55.67
61-65	211	327	10		3	60.78
66-70	151	255	3		0	62.81
71-75	77	154	6		1	66.87
76-80	37	93	3		0	71.54
80+	8	11			0	57.89

Table 6. EBV among deceased organ donors 2008-2012

EBV among deceased organ donors 2008-2012						
AgeQuin	Negative	Reactive	Awaited	Not tested	Unknown	Proportion reactive
0-5	5	4	8	16	14	44.44
6-10		2	9	7	8	100.00
11-15	7	5	23	17	23	41.67
16-20	11	22	59	93	55	66.67
21-25	5	26	43	88	50	83.87
26-30	7	22	62	101	33	75.86
31-35	3	28	57	100	47	90.32
36-40	9	50	83	160	63	84.75
41-45	9	52	112	232	83	85.25
46-50	12	72	149	271	79	85.71
51-55	20	93	148	276	76	82.30
56-60	12	83	133	275	74	87.37
61-65	16	68	124	263	81	80.95
66-70	15	47	108	199	41	75.81
71-75	8	24	57	117	30	75.00
76-80	2	19	27	67	18	90.48
80+		4	2	10	3	100.00

There are no specific data from blood donors but it is felt unlikely that they are significantly different from the general population. Although young donors are not currently excluded from the blood supply to neonates and infants, the NHSBT/Public Health England surveillance team has never received a report of EBV transmission from blood since its inception in 1996. Therefore either these cases are not reported, they are not being recognised or they are not happening.

4.1.1.3. CLINICAL IMPACT OF EBV, CMV and B19 IN NEONATES

CMV has a significant clinical impact on fetuses and preterm neonates, as was thoroughly reviewed in the report of the SaBTO CMV steering group (March 2012) and the important points from the report are summarised here. Vertical transmission with postnatal infection through breastfeeding is an important route of transmission. Congenital infection also occurs, especially with primary maternal infection in pregnancy, and is not uncommon, with rates of 0.3% of live births in the UK and 1% of live births in the USA. Up to 20% of babies who acquire congenital CMV die, and it is a significant cause of sensorineural hearing loss and cerebral palsy. Congenital CMV may also cause damage to other organs including the liver, eyes, and lungs. Although postnatally acquired CMV has probably less severe consequences than perinatal CMV, there may still be significant morbidity, particularly for preterm, low birth-weight babies.

For EBV, there is less known about the impact of congenital or postnatal EBV acquisition, suggesting that it has less clinical consequence. Informal opinion from neonatologists has demonstrated that they are unaware of EBV causing clinically significant problems and do not usually consider testing for it.

However, it is possible that EBV could be causing problems such as pneumonitis or hepatitis in some neonates without being recognised as the primary cause.

There are a small number of reports in the literature on the outcome for the fetus of mothers who had had primary EBV infection during pregnancy. These are reported as either case reports or small case control studies, describing EBV in association with congenital anomalies, prematurity, still birth, hepatitis or biliary atresia. It is difficult to make any firm conclusions from such small studies[4,5,6].

In older children, EBV causes infectious mononucleosis, and in immunosuppressed paediatric transplant recipients it can cause post-transplant lymphoproliferative disorder (PTLD).

B19 can cross the placenta and foetal infection is associated with severe anaemia and transfusion dependence. Foetal death is seen in approximately 10% of B19 intrauterine infections and transplacental transmission most commonly occurs in the 2nd trimester[7]. B19 is known to cause hydrops fetalis in both foetuses and newborns[8].

It is therefore proposed to conduct a study in which donor archive samples held by NHSBT are tested for CMV, EBV and B19 DNA and antibody in order to define the antibody prevalence and hence the proportion of susceptible donors. Samples will also be tested for the presence of plasma viraemia in order to define the incidence of viraemia. The possibility of defining the annual attack rate by retesting subsequent samples from susceptible donors will also be considered. The incidence of viraemia, prevalence of antibody and the attack rate will be determined for 17 year-old donors and compared with these parameters in a cohort of unselected donors.

4.2. Work proposals for Club 96 donor study

The study will investigate the prevalence of plasma viraemia and antibody seroprevalence for CMV, EBV and Parvovirus B19 in 17 year old donors. Protocols for defining these parameters are laid out below.

4.2.1. Identification of archived first time 17 year old donor samples from 2011

NHSBT records will be used to identify routine archival samples from people who were aged 17 when they donated in 2011. Such samples are routinely held from all donors and stored for a period of three years following donation. 2011 was chosen as this will allow access to later samples from repeat donations from donors fond to be seronegative at their first attendance. Detection of seroconversion will also allow a formal measure of the attack rate for the three infections.

The target is to select 180 donors (90 male: 90 female) per month for the study, to provide a panel across the year of 2,000 donor samples split equally male:female. The excess allows for the discard of samples of insufficient volume.

Data will be collected on age, gender and ethnicity.

4.2.2. Identification of control samples from unselected donors over 2011

The plasma viraemia and seroprevalence of EBV, CMV and B19 amongst 17 year old donors will be compared to that of a control donor group comprising 2,000 randomly selected donors (but with gender selection only for 1,000 male and 1,000 female) selected as before with 90 donors of each gender per month.

4.2.3. Detection of virological markers

- Detection and quantification of viraemia by quantitative PCR (qPCR)

Plasma nucleic acid (NA) will be extracted from 250 microliters of donor samples using the Roche automated MagNaPure 96 platform. The NA extracts will be tested for EBV, CMV and B19 DNA by internally controlled assays in separate qPCRs on the ABI 7500 platform. Data will be analysed by the ABI SDS software and viral load in IU will be measured against serial dilutions of WHO standards for each marker. DNA positive samples will all be examined for the presence of IgM antibodies to the appropriate marker.

- Determining seroprevalence

Anti-CMV, anti-EBV and anti-Parvovirus B19 will be sought using validated commercial IgG kits and a robotic liquid handling platform. All or a subset of samples found to be IgG reactive will be further tested for IgM antibody.

4.2.4. Measuring seroconversion rate donors to define attack rate

The acute viraemia and seroprevalence study will identify PCR negative and seronegative donors. Subsequent donation samples, in the first instance only from 17 year old donors (identified by donation in 2011) held in the 2011-2013 archives (selecting those after a minimum period of 6 months from first donation) will be identified and retrieved. Serology will be undertaken on later donations from the previously seronegative donors, including any subsequent samples from donors whose first sample also contained viral genome at the first time of testing. This will define the attack rate for EBV, CMV and Parvovirus B19 in the 17 year old donor population. It will also confirm where later appropriate samples exist that seroconversion follows in “genome only window” donors. Such samples will be identified even if the donation interval is less than 6 months (see above).

Based on UK seroprevalence data, it is estimated 660 EBV sero-negative, 1,300 CMV seronegative and 640 Parvovirus B19 seronegative donors from the 2,000 17 year old donors will be identified and their possible later donations available for investigation in this follow-up study.

The option will be retained to conduct a similar exercise on seronegatve control donors for comparative purposes.

4.2.5. Funding for this study has been approved in principle by the UK Blood Services (subject to final protocol and costings). The cost is in the region of £100-150k.

4.3. Prioritisation

The recommended use of donations from these young donors needed careful consideration. Several models were reviewed and three options were presented for discussion by SaBTO on 10 December 2012.

i) protecting the youngest patients first
ii) protecting those previously unexposed to vCJD
iii) protecting those at greatest risk, ie the multitransfused, starting with haemoglobinopathy patients.

There was obvious overlap between these groups, and there was support for the concept of streaming blood from these young donors to specific patient groups. It was agreed that protecting the youngest patients first would be appropriate for the following reasons:

i) this is relatively simple to achieve in practice as there are specific component types made for intrauterine transfusion (IUT), neonates and infants (ie those below one year of age)
ii) by protecting the youngest recipients, a 'firebreak' may be introduced so that (at some point) all children may be considered unexposed to vCJD regardless of their transfusion history
iii) the specific requirements of haemoglobinopathy patients are complex and other working groups are currently gathering and analysing data.

Therefore, when the supply allowed, those not yet exposed through diet or transfusion would be supplied first, followed by those most at risk though multiple transfusions. This is a practical and pragmatic approach, which has not been driven by any specific health-economic model, and no value judgements have been made.

4.4. Modelling

The Health Protection Analytical Team (Department of Health) undertook the modelling of the supply of blood from these young donors, versus the demand for components from specific recipient groups. This was mainly achieved using NHSBT data on blood donation by donors of different ages, and component issue data. Hospital data were used to add information on the age of recipients. There were some areas where data were lacking, and will need to be gathered for any further modelling to be performed – for example, regarding the needs of haemoglobinopathy patients for specific phenotypes.

A number of assumptions were made in the modelling, and are noted in the full paper (Appendix 1). The key assumption was that all donations would be collected as whole blood – this would allow the manufacture of red cells, platelets and plasma from each donation, and also avoid the complication of donors being moved to apheresis platelet panels and thus being unable to donate red cells. There was no need to consider the 80% apheresis rule for platelet production as this relates to vCJD risk reduction which is not applicable in this donor group. It was assumed that plasma would continue to be imported for those born on or after 1 January 1996 until a sufficient supply can be maintained from young donors.

Table 6 shows the total number of whole blood donations from new and repeat donors in different age groups in 2011. The number of donations from 17 year olds is approximately half that of the other age groups, since the average person in this age group will reach 17 (the age that they are eligible to donate) half way through the year. The year that corresponds to the oldest age at which new and repeat donors are still considered to be low vCJD risk is also shown. In 2013, only 0.7% of whole blood donations could be considered to come from low vCJD risk repeat donors. In 2017, this rises to approximately 1.5%.

The expected percentage of total donations that will be obtained from these donors in future years is compared with the expected percentage of total donations obtained from repeat donors in order to illustrate the effect of an increase in collections due to the donations from new donors.

Table 7. Number of whole blood donations from different age groups in 2011 and expected percentage of total donations that will be obtained from low vCJD risk donors (including new donors) in future years

Year low vCJD risk donors can donate in	Age	Number of WB donations			% of total donations	% of total donations from low vCJD risk donors by year
		Female	Male	Total		
2012	16	0	0	0	0.00%	**0.00%**
2013	17	8085	5703	13788	0.72%	**0.72%**
2014	18	18419	14808	33227	1.72%	**2.44%**
2015	19	17646	14254	31900	1.65%	**4.09%**
2016	20	16467	12689	29156	1.51%	**5.60%**
2017	21	16988	12229	29217	1.52%	**7.12%**
2018	22	16692	11320	28012	1.45%	**8.57%**
2019	23	16984	11241	28225	1.46%	**10.04%**
2020	24	17666	11720	29386	1.52%	**11.56%**
2021	25	16446	10997	27443	1.42%	**12.98%**
2022	26	16402	11115	27517	1.43%	**14.41%**
2023	27	15709	11020	26729	1.39%	**15.80%**
2024	28	15594	11033	26627	1.38%	**17.18%**
2025	29	15281	10864	26145	1.36%	**18.53%**
2026	30	15622	11554	27176	1.41%	**19.94%**
	All	995327	932892	1928219		

This modelling suggests that, if commenced now, red cell demand for IUT and IUT + neonatal exchange could be met in 2015 using repeat only donations and 2014 using first time and repeat donations (see separate paper on risks of first versus second donations).

4.5. Operational issues

All UK blood services are developing operational plans, which will take into account the principles and assumptions discussed above regarding whole blood collection (rather than apheresis), the use of repeat donations for manufacture of some components, and the continued import of plasma for certain recipient groups. Arrangements for cross-border sharing of inventory will also be developed.

Key operational plans are as follows:

i) Donations from suitable donors will be manually identified at the point of collection, with the packs annotated in the way that donations suitable for neonatal use are currently identified.
ii) Until the point of sufficiency is reached for each specific component, there will be "invisible enrichment" of the supply of these components with donations from young donors. No new product codes will be created and no obvious differences will be evident to the recipients.
iii) There will be no electronic/software manufacturing control of these components at this time since it will be necessary to supplement the supply with donations derived from older donors. Once the point of sufficiency is reached, software control may be activated to prevent other donations being used for manufacture of the relevant components.

4.6. Testing of donors prior to their 17th birthday

It would be possible to bring forward the time at which the first full donation from a 17 year old may be used for manufacture of certain components, while maintaining the virus safety of a second donation. This could be achieved by taking blood samples for microbiology testing from the donor before their 17th birthday. If the results are negative, then a full donation could be taken as soon as possible after their birthday, avoiding the usual inter-donation interval. SaBTO approved this approach if operationally necessary (December 2012). At present, UK Blood Services are not all planning to make use of this option.

5. Market research

A joint UK Blood Services market research programme has been undertaken with the objective of understanding the attitudes and behaviour of this age group towards both blood donation and media consumption. This research has been segmented so that each of the services can develop marketing programmes targeted to their key audiences.

A full report has now been given to each of the UK Blood services. A summary report is appended to this document (Appendix 2) which details the key qualitative and quantitative findings of the research.

The output of the research will now be used to develop recruitment and retention programmes that maximise the donations from donors born after 1 January 1996. These will build on the success of a more generic recent campaign to recruit young donors (100,000 registered donors in 100 days).

6. Communications

A communications handling plan has been developed to ensure that NHSBT staff are effectively briefed, and that all questions from media, donors, customers and other stakeholders are handled in a consistent manner. The plan contains the key messages to be communicated, an activity plan with key dates and a Q&A document. No proactive external communication activity is planned at this time.

7. References

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8. Appendices

Appendix 1. Non-vCJD exposed blood donors and recipients: a self-sufficient supply chain?

See separate document

Appendix 2. Market Research Summary

See separate document