



# **Pandemic Influenza**

## **Planning for Blood Organisations**

*Consolidating the work of the*

*European Blood Alliance  
Emergency Planning Action Group  
(EBA EPAG)*

**May 2009**

## CONTENTS

Section	Page
Terms and Conditions of Use	4
Acknowledgements	4
EBA EPAG Participants	5
1 Using this Document	6
2 Introduction	7
3 Influenza	8
3.1 Avian or animal influenza	8
3.2 Seasonal influenza	9
3.3 Human pandemic influenza	9
4 Context and Stakeholders	12
5 Legal and Related Considerations	12
6 Overall Aims and Objectives	15
7 Enabling Principles	16
8 Planning Assumptions	17
9 Impact Assessment	19
9.1 Transmission of influenza through blood service activity	19
9.2 Changing need for blood components and services	20
9.3 Donor availability and welfare	21
9.4 Staff availability and welfare	23
9.5 Consumables and supply chain	24
9.6 Equipment and infrastructure	25
9.7 Financial	25
10 Shaping the Response – The WHO Alert Levels	26
11 Response Objectives	27
12 Response Action Areas and Actions	28
12.1 Leadership (including command, control and management structure)	29
12.2 Prioritisation of activities	36
12.3 Communications	37
12.4 Recipient safety and donor deferral	38
12.5 Maximising and managing the available supply	41
12.6 Donor safety and availability	45

	<i>12.7 Staff safety and availability</i>	49
	<i>12.8 Consumables and supply chain resilience</i>	53
	<i>12.9 Equipment and infrastructure</i>	56
	<i>12.10 Finance</i>	58
13	Recovery and Second Wave	59
14	Return to Normality	62
15	Training and Exercising	63

## Appendices

1	Major Planning References and Resources	64
2	Pandemic Planning Framework	65
3	Pandemic Planning Checklist	67
4	Potential Practice Changes – Tabulation and Assessment Matrix	70
5	Pandemic Influenza Communications Framework	72
6	Sequencing and Reporting	75
7	Example Key Stakeholder Analysis	78
8	Supplier Risk Assessment Questionnaire	79
9	Blood Shortage Plans Checklist	80
10	Pandemic Influenza Plan Outline Headings	83

## Terms and Conditions of Use

*Property of, and copyrighted to, the European Blood Alliance (EBA). Any use of this document must acknowledge this source and ownership. It is shared with blood organisations to assist them in planning for an influenza pandemic. This document should not be considered a substitute for specific planning by any individual organisation using all available and relevant resources. This document is intended to assist planners. It does not constitute official guidance of any kind.*

*Neither EBA nor the author undertakes to provide updates nor warrants the fitness of this document for use by any specific organisation. The author, EBA and its members disclaim any legal liability arising from its use by any person or organisation.*

## Acknowledgements

This document has been produced by an emergency planning working group which was established, sponsored and supported by the European Blood Alliance (EBA). It could not have been produced without support from the Chair of the working group, Mr Andrew Kelly and the group members over its duration who are listed individually in the following section.

The document draws on various plans and documents which are available in the public domain (acknowledged as references in Appendix 1) and, specifically, on material which has been created to assist pandemic planners in blood services by both the Alliance of Blood Operators and the European Blood Alliance.

In many places this document is a re-edited version of a pandemic plan which was originally produced for NHS Blood and Transplant in the UK. We are grateful to Mr Keith Grimmett, Head of Emergency Planning, who kindly agreed to the re-use of their material.

In addition, some of the information included in this plan has been derived from material generously provided by Dr Gilles Folléa, of the Etablissement Français du Sang, Pays de la Loire.

**Richard Bedford, editing author, RJB Associates Ltd**

## EBA EPAG Participants

This document has been produced by the European Blood Alliance Emergency Planning Action Group (EBA EPAG). All those who have participated actively as members of this working group during its period of operation have contributed both directly and indirectly to it.

These members are acknowledged here and listed alphabetically by surname below.

Name	Organisation, Country
Mr Richard Bedford	NHS Blood and Transplant, then RJB Associates Ltd, UK
Mr Robert Broothaerts	Flanders Red Cross Blood Service, Belgium
Ms Isabelle Cortens	Flanders Red Cross Blood Service, Belgium
Dr Bengt Ekermo	Linköping University Hospital, Sweden
Mr Keith Grimmett	NHS Blood and Transplant, UK
Mr Kieran Healy	Irish Blood Transfusion Service, Ireland
Ms Dinie Hoentjen	Sanquin Blood Supply Foundation, The Netherlands
Mr Andrew Kelly	Irish Blood Transfusion Service, Ireland
Dr Gunn Kristoffersen	Stavanger University Hospital, Norway
Dr Guy Levy	Swiss Red Cross Blood Service, Switzerland
Dr Fatima Nascimento	Instituto Português do Sangue, Portugal
Dr Rut Norda	Uppsala University Hospital, Sweden
Ms Eeva Nyberg-Oksanen	Finnish Red Cross Blood Service, Finland
Dr Satu Pastila	Finnish Red Cross Blood Service, Finland
Prof. Harald Schennach	Austrian Red-Cross Blood Services, Austria
Dr Rolf Størkson	Haukeland University Hospital, Norway
Mr Dominiek Vanaudenaerde	Flanders Red Cross Blood Service, Belgium

## 1. Using this Document

A severe pandemic will undoubtedly have a significant strategic impact on blood organisations and therefore this document should, in its entirety, be of interest to Chief Executives, Medical Directors and other senior officers responsible for the blood supply.

The overall aim of the document is to help blood organisations to perform their own planning and/or to assist those who have planned and prepared considerably to review and refresh their plans.

Readers should use whichever part(s) of the document will assist them most with their own planning and preparations. The document is provided in MS Word and is deliberately editable as it is likely to be of most help if its contents are made accessible for cutting, pasting or editing. Provided that the document is first read carefully and material within it is used in accordance with its terms and conditions of use (page 4) then there is no objection to it being used in this way.

For convenience, particularly in section 12 on “Response Action Areas and Actions” the document contains some highlighted lists of key points for consideration. These are marked as follows:

Some key points to consider include:

These lists can be used to quickly gain an overview of certain key aspects of the response issues but care should be taken not to rely on these lists as comprising all of the actions or points to be considered..

In order to make best use of the document, the following approach is recommended:

- Review the list of contents for an overview of the document and its structure.
- Read the body of the document carefully and skim the appendices.
- Return to the lists, tables and tools as required.
- Use the document in the way which works best for you.

## 2. Introduction

In late 2006, the European Blood Alliance (EBA) established an emergency planning working group comprising emergency planning leads from member blood services. This group was known as the EBA Emergency Planning Action Group (EBA EPAG). Through EBA EPAG, participating organisations have shared information, challenges, ideas, plans and tools, all of which have helped each to create or improve its own planning and preparations for pandemic influenza.

The EBA EPAG determined early in its existence that it was not its role to plan either for the EBA or for its member organisations but rather to create the opportunity to help each participant to plan better for themselves. It was never the intention of the EBA EPAG to create a common plan.

Whilst the threat of a human influenza pandemic is common to all, and planned responses from country to country will necessarily have much in common, the detailed plans of the various member countries and their respective blood organisations differ considerably. This is because different governments, public health authorities and blood services are either at different stages in their own planning or they are, currently at least, choosing to emphasise different strategies or policies in their response. The most obvious and visible examples of such differences are, for example, policies being developed in relation to the use of specific personal protective equipment such as face masks. In some countries, it is government policy to provide and expect the wearing of face masks by the population. In others, such measures are restricted to very specific sectors of the population. Whatever the science, psychology or politics behind such differing policies, such major and visible differences in public health response inevitably change the planning context for organisations especially those which are so highly dependent on discretionary public activities such as blood donation.

Despite such differences, members of the EBA EPAG have found it invaluable to share the challenge of pandemic planning including the opportunity to become much more aware of such important variations between themselves.

The EBA EPAG has recently determined that it has gone as far as it can in following this process through regular meetings and has decided to consolidate its work into this document which, it is hoped, will serve to document common understanding amongst participating

members and which may also assist those who, for a variety of reasons, have not been able to take part directly in the process themselves.

Each blood organisation should plan, prepare and remain prepared for a severe human influenza pandemic. Any influenza pandemic response plan should be constructed and adapted in accordance with national and local public health guidance and, where possible, should also be devised to be generic and flexible enough to respond to almost any serious human infectious disease outbreak.

This document is not intended to be a substitute for the important process of planning. The EBA EPAG firmly believes that each organisation must plan and prepare for itself. Indeed, the process of understanding the threat, thinking through, documenting and preparing the responses together with training and exercising the organisation are vital steps towards being prepared to face that threat.

### **3. Influenza**

The influenza virus exists in many sub-types and is rapidly and constantly evolving. In forms which are well adapted to humans it is highly infectious. Its symptoms range from mild feverish disease through to severe, debilitating illness which alone or in combination with complications such as bacterial pneumonia can cause severe morbidity or death.

#### 3.1 Avian or animal influenza

Influenza A viruses are often circulating within and between bird or animal (commonly pig) populations. Sometimes, as with the current H5N1 risk, they are particularly virulent causing widespread death of infected birds or animals. They are occasionally caught by humans who work or live in very close contact with infected animals or birds. Avian or animal influenzas which remain confined to animals or birds with only very small, sporadic outbreaks in humans are not predicted to have a major impact on the operations of blood organisations. This is because such influenzas are diseases of birds and animals and are, in this state, poorly adapted to human hosts. In the event of an avian or animal pandemic affecting farmed populations there would be significant impacts on the economy and animal health and husbandry. However, direct impacts on human health are limited and even severe control measures (culling), if effective, can be expected to have not more than localised impacts on blood organisation activities. There is likely to be localised restriction on movement, some public anxiety about avian or animal influenza and probably some confusion with human pandemic influenza and these effects could, for example, reduce public attendance at blood donation sessions. However, it is assumed government messages to explain the situation

and calm the public, the use of normal management information and response actions would suffice to respond to any significant outbreak(s) of influenza amongst birds, animals and small and contained numbers of humans. Therefore planning specifically for animal or bird influenza outbreaks is not generally necessary for blood organisations.

However, from time to time, an Influenza A virus which is prevalent in the bird or animal population will emerge as novel in humans with an associated mutation which makes it able to transfer itself readily from person to person. Such transfers are believed to be the causes of human influenza pandemics. This is the connection between “avian”, “swine” influenza etc. and human pandemics for which blood organisations must plan and be prepared.

### 3.2 Seasonal influenza

Seasonal influenza occurs every winter. The effect on the population as a whole is generally not severe. The importance of seasonal influenza in relation to human pandemic influenza is that promoting good health, hygiene and vaccination habits during seasonal outbreaks will help individuals and organisations be better prepared for a pandemic when it arrives as well as reduce absence from work due to seasonal influenza itself. It is also theoretically possible that, by ensuring that significant number of people are vaccinated against seasonal flu, some advanced immunity to the pandemic virus could be conferred and/or the pandemic virus will be afforded fewer opportunities to mutate. Seasonal influenza does reduce donor availability and increase staff absence rates during the winter. However, these effects in themselves are not sufficiently severe to require any special crisis management response. Planning for seasonal influenza is not considered further in this human pandemic planning document.

### 3.3 Human pandemic influenza

Human influenza pandemics occur regularly. There were three in the 20<sup>th</sup> Century. These are well documented elsewhere. A human influenza pandemic occurs when an influenza virus emerges (usually from an animal or bird source) to which the majority of the human population has little or no effective immunity. As a result it spreads rapidly infecting large numbers of individuals. If the pandemic virus is particularly virulent then as well as causing widespread illness and disruption, it can result in significant complications including large numbers of deaths.

Influenza type A/H5N1 is a particularly virulent avian flu which has spread widely to many parts of Asia, Eastern Europe and North Africa and is occasionally and lethally transmitted to humans (62% mortality). There is some evidence of very, very limited human to human transmission. Although the next pandemic influenza virus could evolve from H5N1 there is no

certainty that it will do so. Indeed, at the time of editing this document, it is looking increasingly likely that the next, most immediate pandemic virus could be of type A/H1N1 (similar to the “Spanish Flu” of 1918-9) emerging from a pig host source in Central America.

Once the virus has made the transition to humans from animals and is spreading through the human population it is no longer an animal or bird virus but a human pandemic virus for which the primary route of transmission is person to person through respiratory secretions (via coughing, sneezing and/or mutual contact with communal equipment, fabrics or surfaces).

Vaccination is effective against influenza. However, due to the rapid and extensive mutation of the virus and the current limitations of vaccine technology, vaccines must be developed for each strain of influenza. It takes time to develop strain specific vaccines and there is finite and relatively constrained global capacity to produce vaccines once developed. The likely nature of a pandemic will be an exponential spread of infection once early case containment fails. This means that planners must assume that no effective vaccine will be available in time to mitigate the impact of at least the first wave of the pandemic.

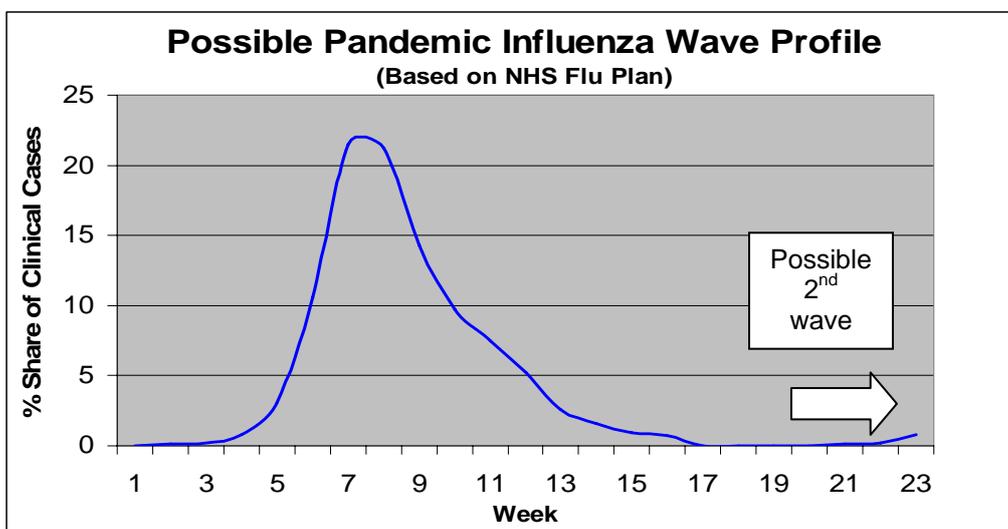


Figure. Possible worst case attack profile of pandemic influenza

Influenza is treatable with anti-virals. These can reduce the severity of disease and/or the risk of complications and may also reduce slightly the duration of symptoms. Many governments have stock-piled anti-virals and are developing strategies for rapid post infection treatment with anti-virals. Whilst such strategies should help to reduce the human and societal impacts of the disease (fewer deaths, less panic etc), post infection anti-viral strategies cannot be assumed to significantly reduce the overall attack rate, absence rate from work or improve the rate of blood donation.

Prophylactically, anti-virals also have an important part to play in early attempts to contain any outbreak. They can, in theory, prevent those in close contact from developing the disease and thus act as a “firebreak” around early cases. This strategy may buy valuable time to progress the development of an effective vaccine. Some governments have also developed some form of limited antiviral prophylaxis strategy usually centred around key workers and in some countries this could include blood organisation workers. Massive quantities of anti-virals are required to treat significant proportions of the population prophylactically and once the pandemic has taken hold, individuals who take anti-virals are quite likely to be infected with influenza after their course completes. Therefore, in the absence of firm evidence to the contrary, the effectiveness of any antiviral prophylaxis strategy cannot be assumed and response plans should generally assume an absence of prophylaxis unless the blood organisation has stock-piled its own supplies and developed its own strategy for use.

Many governments are also developing social distancing (e.g. school closures) and personal protection strategies (e.g. face masks) to try to reduce the overall impact and/or the rate of spread of the infection. The more effective such measures are in practice, the lower the peak impact in the graph above would be and, in all probability, the longer the overall duration of the pandemic.

Human pandemic planning assumptions which are quoted in this document and many of the impacts and response strategies proposed have been derived from national or international planning guidance, modelling or collaborations.

An influenza pandemic will have different characteristics to other kinds of emergencies. For example, in most countries, particularly those far from the epicentre, there is likely to be significant warning of the advancing pandemic, perhaps weeks or even months. This will allow time for most organisations to make their final preparations and “gear up” to respond. However, the global nature of the threat and its severe actual and psychological impact will mean that there will be little chance of securing aid from elsewhere and considerable competition for resources including human resources in the period immediately preceding the pandemic as well as in the pandemic itself. It will be those organisations who have both planned and prepared most effectively in advance who will have the greatest chance of maintaining their services through and beyond the pandemic.

A/H5N1 has been identified as a potential pandemic source since before 2000. Currently, “Mexican swine flu” is notified and escalated as an imminent pandemic threat. The most recent World Health Organisation (WHO) plan for pandemic influenza was published in October 2005 and the WHO, the EU and most major governments have been planning, preparing and urging organisations to plan for more than 4 years. Of course, an influenza pandemic might still not happen or it may not happen for some time yet. There were three pandemics in the last century and all experts confirm that the next is only a matter of time. In this context, as and when a pandemic does next occur, it will not be possible for blood organisations to argue that it was not possible to predict or plan for it in advance.

#### **4. Context and Stakeholders**

An emergency plan should briefly describe the blood organisation to which it applies and the strategic, management and regulatory context in which it operates. The plan should also identify any specific relevant guidance and take this into account when preparing a response.

Key documents and guidance to be taken into account would be:

- National and local public health pandemic influenza plans
- Health and safety guidance
- Guidance, if any, from blood regulators

For a major emergency such as an influenza pandemic, it will be important to contact, collaborate and consult with major stakeholders, such as:

- The blood organisation management board
- Regulatory bodies
- Donor organisations
- Hospitals and users of blood services
- Staff and contractors
- Health and public health departments
- Neighbouring blood organisations / countries

#### **5. Legal and Related Considerations**

The EBA EPAG has not taken formal legal advice, but we suggest that it is very important to be mindful of potential legal considerations when planning for, and responding to, any emergency including an influenza pandemic. The impact of a global pandemic on blood organisations could be severe. It is possible that the blood organisation may consider it necessary, in order to maintain at least a minimum of life-saving services, to take steps

which are outside of its normal practice and even some which potentially contravene regulations normally governing its activities.

In the event of a flu pandemic or major disaster situation the following outline advice may help to mitigate liability arising from any possible infectious disease transmission or other harm which may arise.

In advance,

- plan and prepare as much as possible and ensure that plans are documented and as flexible as possible.
- involve regulatory bodies in the planning and evaluation of options which may be considered necessary especially those which may contravene local, national or super national (e.g. European) regulations.

During the emergency,

- clearly document the actual emergency context and, in particular, why and how it is impacting the blood supply.
- identify and assess the options available and ensure that all other reasonable measures which could reduce the impact of the actual emergency on the blood supply without the need, for example, to provide non standard products are in place (including, for example, ensuring that blood shortage plans are in place and operating so that blood is only being transfused where unavoidable)
- clearly document the risk assessment and decision making processes to release product that deviates from normal, e.g. testing, processes, the process changes made and the risks for harm which could ensue
- inform the relevant blood service laboratory and medical staff of such decisions and label the product to make it clear that it does not conform to normal standards
- notify the doctors who may be using it that the decision has been made to make available the non standard product and in what way it deviates from the normal product issued, that it should only be used when it is judged clinically that it will do more good than harm, and that if the product is transfused then notifying the patient that the product was non standard is a decision for the treating physician.

In the event that the blood service was sued, these steps would help provide some ground for a defence. It would be more difficult to prove liability for negligence where the context of any decision to change policy was clearly documented and those who could be affected were informed of such decisions.

Practice changes which could significantly adversely affect the safety of donors or recipients or cause confusion amongst staff should be avoided. Where practice changes are considered necessary these should first be those which fall within the regulations and for which there is evidence that they are routinely practised safely elsewhere. Actual changes which could be available and still fall within the regulations will depend very much on normal practice but could, for example, include temporarily reducing the donation interval or changing the minimum or maximum age limits for donation.

Practice changes which would contravene regulations should be only considered as a last resort. These would require careful evidencing (see above) and to be made in consultation with the regulator.

Any major temporary changes to practice deployed to deal with an emergency should be implemented as late as possible and withdrawn as soon as possible.

All changes to current clinical or operational practice have inherent risks. There is the risk that the change itself might have a direct or indirect adverse impact particularly where the change is supported by inadequate evidence or research. There is also the risk that the change may be poorly understood or implemented leading to poor effectiveness in relation to the desired outcome and/or unexpected consequences. Changes to practice in crisis situations should therefore be minimised and selected on the basis of greatest benefit / least risk. It may be helpful when evaluating options to consider using a grid similar to that below to classify potential changes for use in an emergency:

		Benefit of making the change in practice		
		Large	Medium	Small
Risk of making the change in practice	“Illegal”	In extremis & only by agreement with Regulator	No	No
	High	Extreme caution	Extreme caution	No
	Low	Proceed with care	Proceed with care	No

None of the above is formal legal advice and it has not been legally reviewed in any EU countries. Those in charge of blood services should seek their own expert legal advice as relevant. Nevertheless, the above may assist by creating a starting point from which blood services planning for emergencies may define their own framework and substantive legal advice to help them support whatever actions they decide may be necessary in emergencies such as an influenza pandemic.

## 6. Overall Aims and Objectives

The main purpose of this document is to assist blood organisations to plan. When they do so it is important that their plans state clearly the aims and objectives of their plan(s).

In a human influenza pandemic, the blood organisation must assume that it will come under severe pressure to maintain supplies of blood components and services and must plan and prepare accordingly. The overall aim and objectives of the specific plan must be stated clearly and will probably differ significantly for each blood organisation. However, in general terms the objective of the pandemic plan is likely to be along the lines of:

*“To uphold the reputation of the blood organisation through an influenza pandemic by doing the utmost to maintain the continuity of supply of safe, life-saving blood components and associated services to those who require them.”*

The blood organisation needs to plan to respond to the “Reasonable Worst Case” assumptions (see later). It is important to emphasise that there is no certain way of predicting in advance the actual profile or quantitative impact of the pandemic. A wholly mathematical approach to response planning is unlikely to be successful.

The severity and impact of a pandemic will only become clear as the actual disease emerges. It is quite likely that the impact will be much less than the “reasonable worst case scenario”. In order to manage this situation and avoid an “automatic over-reaction”, organisations must have a range of responses identified and ready in the form of a “menu” from which to select the optimal combination of actions. They must have clear and rapid intelligence gathering, decision-making, decision deployment and feedback arrangements in place in order to be able to select and adjust their response as real information about the pandemic emerges.

In these circumstances, it is particularly important to note that the blood organisation’s pandemic response will need to be based upon forecasts of the impact rather than on actual impact. One of the major challenges of delivering the pandemic response will be to take appropriate actions in anticipation of imminent likely impact rather than waiting until the impact has actually occurred and responding “just too late” as a consequence. Nowhere is this more true than in the management of the current and forecast available blood supply.

## 7. Enabling Principles

The blood organisation's response principles should set the tone for the overall response and should also take into account any national guidance as regards ethical policy or similar considerations. The following example enabling principles are considered by the EBA EPAG to be a generally helpful reference point for planners.

### **Priority and Pace**

Managing the response to the pandemic once declared will be a top priority and, at peak, probably the only activity. It will be important to pace the response to maximise the chances of maintaining services for the entire duration of the challenge.

### **Focus on Essential Activities and Services to Recipients**

The major objective will be to make every effort to ensure a continued supply of safe, high quality, life-saving products and services. Specific contentions between essential activities will need to be resolved clinically. It will be vital to co-operate across departments and with hospitals to suspend discretionary activities and services where continuing with these could increase the spread of infection and/or prevent the re-direction of resources to more essential activities.

### **Minimal Disruption**

Standards, operating procedures and related duties and requirements should only be varied to the minimum extent necessary to respond to the emerging influenza pandemic. Every effort should be made to comply with all legislative obligations at all times. Wherever possible, changes will be implemented through proven change control mechanisms.

### **Donor Care and Availability**

Every effort should be made to maintain normal high standards of service to, and care for, donors and to create an environment in which donors are encouraged to donate and will feel safe to do so without being at increased risk of influenza infection.

### **Staff Care and Availability**

The organisation will need to support staff and contractors so as to optimise their ability to help to provide critical, life-saving blood components and services. Additionally, it will need to address the physical, emotional and psychological safety and well-being of staff and others to whom it has health and safety obligations before, during and after the pandemic.

**Transparency**

It will be important to provide regular, up-to-date and accurate information to employees, their staff side organisations and other key stakeholders regarding the pandemic and the blood service's operational response with the aim of maintaining understanding, agreement and mutual commitment to overcoming the pandemic and maintaining the supply of essential products and services.

**Flexibility**

The response should be designed to be flexible so as to remain as proportionate as possible to the evolution of the actual pandemic in real time.

**Public Responsibility**

The response should be consistent with government and public health advice and should not include actions that would facilitate the spread of the pandemic.

**Collaboration between Blood Services**

Blood organisations should exchange information with, seek help from, and provide help to other Blood Services internationally where this is feasible and necessary and should work collaboratively and co-operatively with other blood services especially those with whom there are operational or national inter-dependencies.

**8. Planning Assumptions**

The planning assumptions in this section are derived from work with blood services internationally in the EBA EPAG environment. They are based on publicly available modelling and/or limited evidence and should not therefore be taken as mathematically accurate. Nevertheless it has been agreed that they represent a reasonable basis from which to plan. They should be carefully reviewed and modified where any better local planning assumptions exist.

It is recommended that blood organisations' planning and modelling work is primarily based on the column to the right in the table: the "Reasonable Worst Case Scenario". The "Reasonable Worst Case" represents a severe pandemic similar to that experienced in 1918/9.

The "best scenario" in the table may be considered to be approximately equivalent to a significant outbreak of "seasonal flu", with the "medium severity" column representing a pandemic such as occurred in 1967/8.

Clinical Scenario	"Best Scenario"	"Medium Severity"	"Reasonable Worst Case"
Clinical Attack Rate (% population ill)	5-15%	15-35%	35-50%
All demographic groups affected similarly	Yes		
Over how many waves (for planning purposes)?	1	1	1
Could be over how many waves?	1-3	1-3	1-3
Duration of Pandemic Wave (locally / small groups)	5-8 weeks		
Duration of Pandemic Wave (nationally)	8-12 weeks		
Extra deaths due to Pandemic Flu (% those ill)	0.40%	1.50%	2.50%
Extra deaths due to Pandemic Flu (% population)	0.04%	0.45%	1.25%
Assume international borders remain open?	Yes		
Cancel mass gatherings and/or social distancing?	No	Possibly	Yes
Schools closed as policy to limit spread?	No	Probably	Yes
Most elective healthcare cancelled?	No	Possibly	Yes
Effective Pandemic Flu Vaccine available?	No		
Pandemic vaccine available in first wave	No		
Antivirals generally available for prophylaxis	No		
Antivirals generally available for treatment	Possibly	Yes	Yes
Face masks for public encouraged/supplied as policy	No	No	No
Face mask wearing common place / an expectation?	No	Possibly	Yes
Illness / absence from work duration (calendar days)	9	10	11

Assumed Impact of Pandemic Flu on Blood / Transplant Organisations			
Reduction in Demand for Red Cells	5%	10-25%	10-25%
Reduction in Demand for Platelets	0%	0%	0%
Reduction in Demand for Frozen Components	0%	0-10%	0-10%
Reduction in Demand for Laboratory Services	Relates to transfusion		
Reduction in Demand for Fractionated Products	0%	0%	0-5%
Overall reduction in Donors available	10-15%	15-25%	20-30%
Peak donor reduction (due to illness alone)	5%	10%	15%
Peak staff reduction* (incl. normal absence + caring)	5-10%	20-30%	35-50%
% Additional working days lost over whole wave	2%	4%	7%
Duration of peak	3 – 6 weeks		
Supply chain disruption (e.g. blood pack supplies)	No	Yes	Yes
Infrastructure disruption (e.g. public transport, fuel)	No	Yes	Yes

*\*Peak % absence rates are likely to be worse for small localised teams of co-workers.*

Whilst the pandemic could occur over several waves, a single severe wave is assumed for impact assessment purposes as this represents the “reasonable worst case”. It is then further assumed that a second wave (with or without vaccination) could follow within 1-6 months of the first wave subsiding.

## 9. Impact Assessment

The direct impact of a pandemic is on people rather than plant or infrastructure. The latter is likely to be impacted but this will be due to a lack of people to operate or support the plant or infrastructure.

The impact on people will be:

- Physical (illness) and psychological (anxiety)
- Direct (self) and indirect (others, such as family, colleagues etc)
- Individual and collective (organisations and society)
- Local and widespread (nationally and globally)

The impact of a severe human influenza pandemic on the blood supply is likely to be very significant. Whilst blood services share much in common with other organisations, they also face some specific and unique challenges in a pandemic. When planning for human pandemic influenza, the major potential impact areas for blood organisations are:

- Transmission of influenza through blood service activity
- Changing need for blood components and services
- Donor availability and welfare
- Staff availability and welfare
- Consumables and supply chain
- Equipment and infrastructure
- Financial

Any significant failure to continue to meet demand for its products and services will impact adversely and severely on the reputation of the blood organisation.

### 9.1 Transmission of influenza through blood service activity

Influenza is generally spread via the respiratory tract – through coughing, sneezing, viral shedding and transmission via hard and soft communal surfaces. It is currently considered that when the pandemic is widespread amongst the local donor population, the risk of additional transmissions of influenza through blood itself or associated activities is low. The main reason for this is that to transmit via blood, the donor has to be both asymptomatic and viremic (i.e. have infectious influenza virus in their blood stream). The expert view of influenza is that the onset of, and subsequent subsidence of, the major symptoms and viremia tend to closely co-incide and that screening donors for absence of influenza symptoms together with asking donors about recent close contact with ill persons and to

report any personal illness which emerges soon after donation will minimise any risk of additional transmissions via blood transfusion. This position must be kept under constant expert review via relevant experts.

### 9.2 Changing need for blood components and services

In a severe pandemic, healthcare capacity as a whole will be under enormous pressure. Due to finite and relatively limited specialised capacity, intensive care facilities for treating influenza complications are likely to be under particular strain. As a result, it can be anticipated that medical capacity will be extensively re-prioritised towards basic healthcare and life support. The expectation therefore is that most, if not all, elective surgery and other less urgent clinical interventions will cease or at least be temporarily deferred during the worst periods of the pandemic.

In this context, the demand for blood services will reduce. Less blood and related services will be required. Most international predictions of reduced red cell demand range between 10 and 25% (25% from SARS, Toronto). However, due to successful efforts in some countries over recent years to reduce avoidable blood transfusion, demand for blood component therapy in influenza may not fall by the significant amount that it would have in previous times as a result of suspension of elective healthcare. The demand for certain blood components, such as platelets, may not reduce at all. Our planning assumptions therefore assume only a modest (10%) reduction in demand for red cells and no reduction in demand for other blood components. With the notable exception of frozen plasma components which can be stored for up to two years, most blood components have a short shelf life and significant stock-piling is not practical or possible.

Specialised procedures involving stem cell transplantation may be deferred until after the pandemic where this is possible without significantly compromising patient mortality or where there is simply not the healthcare capacity or expertise to perform these procedures. However, patients who are already undergoing treatment or who are already conditioned for a transplant are likely to continue to be treated.

The demand for specialised diagnostic services provided by blood services is likely to reduce considerably as elective healthcare and transplantation activity is temporarily curtailed. There is, however, a likelihood that hospital laboratories, finding themselves short staffed as a result of the pandemic, will either refer samples to the blood organisation which they would normally have dealt with themselves or request staff from the blood organisation to assist them. Generally, accepting samples and testing them in the blood service's laboratories will

be much more reliable than transferring staff into an unfamiliar environment. Overall, the forecast for diagnostic services is a significant net reduction although this will need to be monitored carefully as the pandemic evolves.

The demand for fractionated blood products is assumed not to be significantly changed by a pandemic. It is possible that there could be some increase in demand or opportunities arising if other commercial suppliers cannot supply their normal contracts. Due to long shelf lives, stock policies and the general nature of the production processes in fractionation plants they may be better placed to hold adequate stocks and continue to meet demand for these products through a pandemic. Nevertheless, a detailed pandemic plan should also be prepared for fractionation in order to minimise impact.

Some countries are known to be exploring the possible use of “influenza immune (convalescent) plasma” to treat victims or to reduce the incidence of pandemic influenza in the absence of a specific vaccine. Blood organisations should ensure they are aware of, and contribute to, any such planning in their country and draw up plans accordingly.

### 9.3 Donor availability and welfare

Blood donors will be affected by pandemic influenza to the same extent as the general public:

- Donors will become ill
- They will need to care for others
- Those in work will have less time to donate as their employers become stretched
- People are likely to modify their normal social behaviours considerably

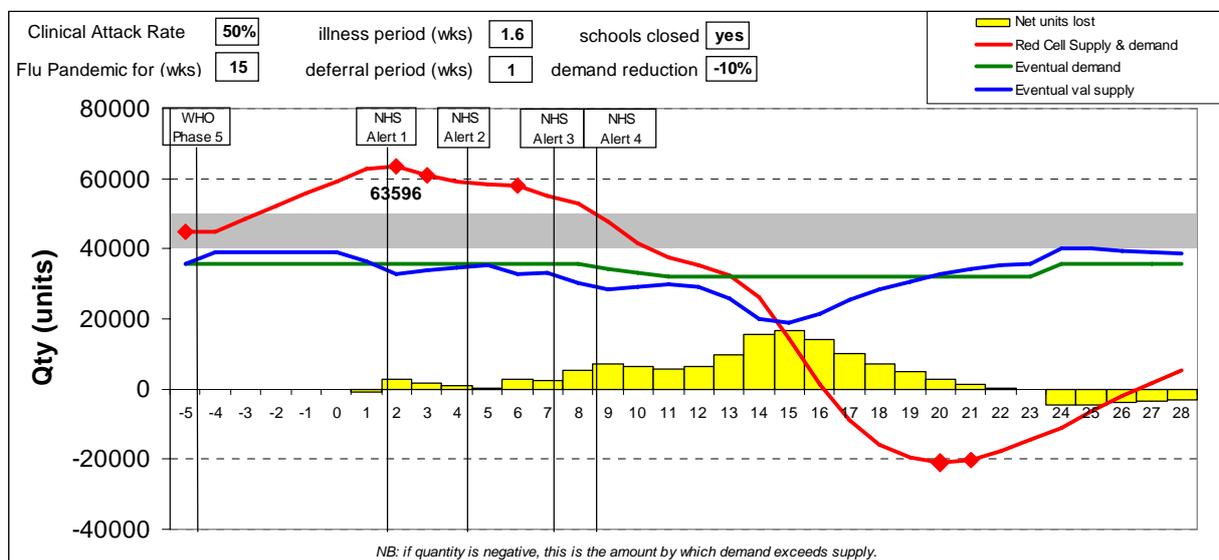
Donors will therefore generally be much less likely to donate blood. In addition, donor selection requirements mean that donors cannot normally give blood until several weeks after making a full recovery from influenza. Those who have been in close contact with a person having an infectious disease such as influenza are also normally asked not to give blood for some time after contact.

There may also be significant changes in donation patterns in advance of the actual pandemic as the WHO pandemic alert level rises due to donors re-prioritising their own activities.

In a severe pandemic, applying all normal donor deferral criteria, work carried out in conjunction with modellers in the UK demonstrated that there could be almost no eligible

donors available around the pandemic peak. Overall, even with significant mitigation measures in place there could still be a reduction in total blood collection of about 30-40% over the whole pandemic wave (cf. 0-10% reduction in demand for blood components).

The UK developed and shared some tools for modelling the possible impact and interaction of blood supply and demand in the “reasonable worst case scenario”. From this modelling, the blood supply was predicted to be severely compromised and, without intervention, blood stocks were likely to run out. This risk should be flagged to those in hospitals who are pandemic planning for wider healthcare. The UK blood supply model was set up with a starting stock of about 45,000 units (c.7 days supply), a significant early stock build as the pandemic approaches, and the parameters stated on the chart.



There may be some restrictions on normal collection sessions if, for example, Universities were to close or if there are any venues which became unavailable (e.g. due to illness of keyholder, temporary closure of businesses or, possibly, restrictions placed on the use of venues locally for gatherings of persons). Some countries, such as Portugal, are known to be planning to limit the numbers of persons who can gather in one place including blood donation sessions. A further complication which may impact blood collection towards the end of the first pandemic wave or beyond relates to the potential vaccination of the public against influenza as a vaccine becomes available. If a mass vaccination approach is deployed then the blood organisation could find itself competing with public authorities for venues normally used for blood collection.

The welfare of donors will be an important priority. The blood organisation’s normally high standards of care will need to be preserved through the pandemic and measures will need to be implemented which are consistent with the overall national plans for healthcare facilities in a “well person” setting. Exactly what these measures will be will depend significantly on how

blood donations sessions are viewed (e.g. in Austria and some other countries they are established formally as “clinics” and they are expected to match other outpatient clinics), on measures being implemented in the wider community and on public expectations. Blood services may need to create the capacity in advance to be able to adapt rapidly during the pandemic as some of these considerations will inevitably change.

#### 9.4 Staff availability and welfare

Blood service staff and those of the suppliers and contractors on whom it depends will be severely impacted by the pandemic. Staff absence rates could peak between 25% and 40% with small teams potentially being hit even harder (up to 100% absence) for short periods of 2-3 weeks.

There is a small but real risk that entire departments or sites could be forced to close for short periods due to lack of key staff. Where possible backup arrangements for such staff should be planned.

Staff shortages of this magnitude in and around an organisation upon whom the lives of others depend will place enormous strains on clinicians, managers and staff alike. Stress and anxiety levels are likely to be high amongst staff. On the positive side, the generally high motivation and commitment of blood service staff to the mission of the organisation will undoubtedly be demonstrated. However, care will need to be taken to watch for staff acting more “heroically” than is in the interests of their colleagues, their own welfare or the patients and donors who the organisation serves.

In particular, staff who are unwell must not attend work.

It cannot be assumed that resources will be available in the market place (e.g. agency staff) nor from potential mutual aid sources. Other organisations in the same geography, particularly other healthcare organisations, will be under simultaneous, severe staffing pressures of their own.

Contractors (e.g. transport providers) will be equally hard hit.

Blood service staff who are either based in hospitals or whose work frequently takes them into hospitals will need to be considered carefully. Generally, these staff will be expected to follow the measures implemented by the host hospital but these blood organisation staff

could be more anxious than others and could also find themselves being approached directly with requests to redeploy to the influenza “front line”.

#### 9.5 Consumables and supply chain

Supplies of key consumables will also be impacted. Surveys and discussions with key suppliers by a number of blood organisations have suggested that suppliers may be forced to close factories for short periods at the pandemic peak due to shortages of their key staff. In addition, some factories are likely to take time to recover to their full pre-pandemic capacity. There will be a significant resulting backlog which is likely to require a protracted re-stocking period. The combination of these impacts is likely to erode any normal safety stock levels and could cause localised or short term shortages of key consumable items. Timing of supply chain difficulties for suppliers relative to the blood organisation’s own problems could be different depending on their geographic location. Where suppliers have been asked if they will preferentially favour blood services or guarantee supplies in a pandemic most have, unsurprisingly, declined to do so. In general, improved guarantees of continued supply or stock holding by suppliers will only be considered at a cost.

In these circumstances the blood organisation must take responsibility for planning and preparing itself to ensure it has adequate access to critical supplies.

Without careful planning and adequate stocks, shortages may be further exacerbated by the blood organisation increasing its use of consumables as it builds blood stocks ahead of the pandemic resulting in severe and, possibly, prolonged shortages at or after the pandemic peak. Donor availability is likely to restore relatively rapidly post pandemic peak and a shortage of consumables at that point could seriously hamper any efforts to restore blood stocks quickly in time for a potential second wave.

Maintenance and support providers will face similar staff pressures and therefore potential service outages around the pandemic peak. The timing of such outages could also be different to the timing of the local peak especially where technical support comes from overseas.

Unlike much of the healthcare system, blood organisations deal almost entirely with well persons. Nevertheless, appropriate increased infection control measures will be required leading to demand for consumable items which are either not normally used at all in blood collection (e.g. face masks) or which are currently used but will be required in significantly larger quantities in a pandemic (e.g. sanitising hand gels).

### 9.6 Equipment and infrastructure

Using published planning guidance and in collaboration with public health authorities, blood organisations need to assess whether or not blood donation sessions will be hampered by any restrictions which might be placed nationally, regionally or locally on “gatherings” restricting access to its normal blood collection venues. Some restrictions may still occur for other reasons such as illness of the keyholder. It is also possible that as vaccine becomes available on a large scale (possibly towards the end of the first wave), then mass vaccination centres could be established by local authorities. These could compete for venues normally used by the blood organisation to collect blood.

Most countries are assuming that infrastructure will continue to operate with only minor, sporadic, short term or highly localised disruptions and that international borders will remain open to the free movement of key materials, consumables and persons (e.g. specialised engineers).

The blood organisation’s own infrastructure of buildings, IT systems, vehicles and equipment could be impacted due to insufficient staff or as a result equipment breakdown and more difficulty than normal in sourcing timely repairs.

### 9.7 Financial

There will be a significant impact on the economy as a whole as a result of lost capacity and income as a result of the pandemic. In addition, there will be additional costs of maintaining the organisation through the pandemic. Not only, for example, will many organisations bear the additional cost of paying staff for more absence than normal, they will also be forced to cover this absence with more expensive options such as overtime or agency staff.

Estimates made of the possible net financial impact of a severe pandemic have been made. In total, we estimate that the total net financial impact could be in the order of 4-5% of the blood organisation’s total annual budget. Most blood services are funded through the healthcare system either directly or indirectly. Blood organisations, particularly those funded via income for products or services, will therefore be far from immune from this effect. Similar effects will be experienced by all organisations which will make the likely availability of money to redress the financial impact after the pandemic severely limited. If the pandemic coincides with a period of economic downturn, this situation will be considerably compounded.

## 10. Shaping the Response – The WHO Alert Levels

The WHO pandemic alert levels will form an important framework for all countries when planning, preparing, responding to and recovering from, the impact of the pandemic. However, in order to maintain flexibility and respond to the actual pandemic rather than a hypothetical one, the actual response must be moderated by emerging intelligence and advice as the pandemic approaches and passes through. Where the blood organisation's detailed response plans are set out against these WHO alert levels, they should be interpreted and adjusted with care at the time. We therefore recommend planning against the WHO alert levels as potential triggers whilst taking care not to slavishly follow those plans using the declaration of WHO alert levels as triggers for specific actions.

It is important to recognise that WHO alert phases are global. For example, phase 6 (pandemic period) does not mean that the pandemic is occurring in any particular country or has any particular impact throughout the whole of this phase. Therefore, responses should not simply be linked to, for example, WHO phase 6 but should instead be linked to the actual manifestation of the pandemic in the country or locality of each organisation.

Many countries have established more detailed alert levels of their own linked to the WHO alert levels. Where this is the case blood organisations should understand these and link their planned response into this structure as appropriate. Nevertheless, the same principle of tailoring to the response of the actual pandemic situation rather than slavishly following alert triggers should be maintained.

Public declaration of alert levels could form an important context for implementing certain key decisions. For example, major changes to blood donor selection criteria which could contravene guidelines or, even more importantly, legal requirements should not be considered until well into WHO phase 6 and not until the pandemic impacts more severely locally. Tying the actual response to the publicly declared alert levels will help but cannot be relied upon to provide protection from adverse publicity or from subsequent legal action. In general, continuing to comply with at least all legal obligations should remain a constant objective.

It is not possible to predict with accuracy the duration of any particular phase of the pandemic and certainly the later (post WHO 3) pandemic phases should not be relied upon to provide time to prepare (e.g. by leaving all building of stocks until that point).

The WHO alert levels are:

Inter-pandemic period	
<b>Phase 1</b>	No viruses circulating among animals have been reported to cause infections in humans.
<b>Phase 2</b>	An animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans, and is therefore considered a potential pandemic threat.
Pandemic Alert Period	
<b>Phase 3</b>	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. Limited human-to-human transmission may occur under some circumstances, for example, when there is close contact between an infected person and an unprotected caregiver. However, limited transmission under such restricted circumstances does not indicate that the virus has gained the level of transmissibility among humans necessary to cause a pandemic.
<b>Phase 4</b>	Verified human-to-human transmission of an animal or human-animal influenza reassortant virus able to cause “community-level outbreaks.” The ability to cause sustained disease outbreaks in a community marks a significant upwards shift in the risk for a pandemic. Any country that suspects or has verified such an event should urgently consult with WHO so that the situation can be jointly assessed and a decision made by the affected country if implementation of a rapid pandemic containment operation is warranted. Phase 4 indicates a significant increase in risk of a pandemic but does not necessarily mean that a pandemic is a forgone conclusion.
<b>Phase 5</b>	Human-to-human spread of the virus into at least two countries in one WHO region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short.
Pandemic Period	
<b>Phase 6</b>	<p>Pandemic phase: Community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in <b>Phase 5</b>. Designation of this phase will indicate that a global pandemic is under way.</p> <p>During the <b>post-peak period</b>, pandemic disease levels in most countries with adequate surveillance will have dropped below peak observed levels. The post-peak period signifies that pandemic activity appears to be decreasing; however, it is uncertain if additional waves will occur and countries will need to be prepared for a second wave.</p> <p>Previous pandemics have been characterized by waves of activity spread over months. Once the level of disease activity drops, a critical communications task will be to balance this information with the possibility of another wave. Pandemic waves can be separated by months and an immediate “at-ease” signal may be premature.</p>
Post pandemic period (Return to inter-pandemic period)	
	Influenza disease activity will have returned to levels normally seen for seasonal influenza. It is expected that the pandemic virus will behave as a seasonal influenza A virus. At this stage, it is important to maintain surveillance and update pandemic preparedness and response plans accordingly. An intensive phase of recovery and evaluation may be required.

## 11. Response Objectives

The overall response objective for the blood organisation is likely to be to endeavour to maintain the provision of critical products and services at, or above, the level demanded by the healthcare community throughout the pandemic, the recovery period and, if applicable, subsequent pandemic wave(s).

If, despite best endeavours this cannot be achieved, for example in relation to red cell or platelet supplies, the blood organisation will need to be ready to implement fair, equitable and clinically appropriate product and service shortage management strategies and plans.

The importance of ensuring that there are pre-prepared and, preferably, pre-published and widely accepted shortage management plans in advance of a pandemic cannot be over-emphasised.

To continue to maintain services to those in most clinical need right through to the end of the pandemic, it may be necessary to deploy such shortage management plans early based on forecasts in order to conserve available resources before they actually reach critically low levels.

Focusing on the above objectives and approach, with effective national and local clinical input, together with managing communications with all stakeholders in an open and timely manner will be key to minimising any adverse impact on the blood organisation's reputation and public standing.

## **12. Response Action Areas and Actions**

The major response action areas for blood organisations are:

- Leadership (including command, control and management structure)
- Prioritisation of activities
- Communications
- Maximising and managing the available supply (including shortage management)
- Recipient safety and donor deferral
- Donor safety and availability
- Staff safety and availability
- Consumables and supply chain resilience
- Equipment and infrastructure
- Finance

Where planned response actions would require IT changes (e.g. changes in deferral or testing criteria which are controlled by the IT system) these should be assessed more carefully and considered for early development and/or validation ahead of the emergence of the pandemic. In general, actions which do not require complex IT or procedural changes are preferable to those which do. In some cases, the blood organisation may determine that additional, pandemic specific IT systems need to be developed (e.g. to help manage staff

attendance and deployment). If so, these systems need planning and developing well ahead of time.

The following sub-sections provide an overview of the response and some additional detail in each of the above areas.

### 12.1 Leadership (including command, control and management structure)

Clear and visible leadership of the response must be provided via the blood organisation's management arrangements enhanced, as appropriate, by emergency response command and control arrangements. Importantly, effective clinical as well as managerial leadership will be vital. The exact leadership and management arrangements will depend on the normal management structure of the blood organisation and any special command and control arrangements which the organisation may have created to support the deployment of its emergency planning system. It is therefore not possible to represent in any exact way the arrangements in a consolidated document of this kind.

For management, pandemic influenza will have characteristics which will distinguish it from other types of crisis. In particular, its impact will be widespread, it is likely to impact directly on persons within the management structure and it will be of long duration. Pandemic influenza is not a short sharp local crisis.

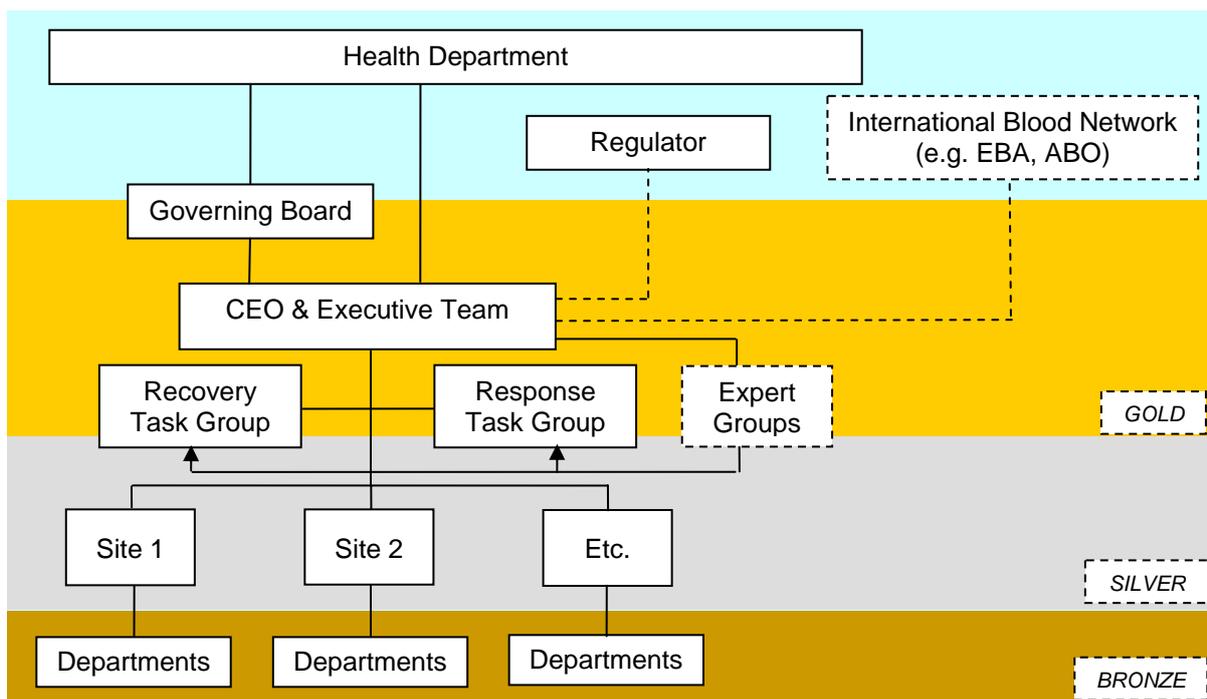
#### Key points to consider in relation to command and control include:

- Senior management should provide clear and visible leadership, leading by example.
- Adhere as closely as possible to the organisation's normal leadership and management arrangements but establish explicit arrangements and accountabilities for managing the crisis.
- As well as reflecting the normal management structures and reporting lines, the arrangements should reflect the geographic operational spread of the organisation.
- The frequency and intensity of management activity will increase as the pandemic approaches, arrives and passes through. (It will be important to establish a "battle rhythm" and to be able to intensify this as the pandemic approaches).
- Around the peak of the pandemic face to face management meetings should be minimised (to reduce the risk of infection).
- All meetings, decisions and actions will need careful recording.
- Robust backup arrangements will be necessary to maintain continuity of management arrangements as and when key managers get influenza. It is recommended that at least two deputies are identified for each key manager.

- True influenza is a highly infectious and severely debilitating illness. It is unlikely that managers with influenza will be able to work from home while unwell and ill persons must not attend the workplace no matter how senior. The response plan should not, at any level, depend on staff trying to co-ordinate the response from their sick bed.
- It may be appropriate to form a separate pandemic recovery team early in the pandemic in order to be able to focus separately on this important aspect (see later).
- As well as information on the blood supply chain (e.g. blood collection, blood demand and blood stocks) the management team(s) will need accurate, detailed and timely information which might not normally be routinely available (e.g. staff attendance data, consumable stock data).
- The timing and duration of these arrangements will be important. It is assumed that the organisation will formally switch from “planning” through “preparedness” at WHO 3/4 increasingly towards “response” mode at WHO 5/6. Then, until the pandemic is “over” (at least nationally), addressing the flu pandemic probably becomes the organisation’s top priority.

In command and control arrangements for emergency services in the UK and in this document, the term GOLD, SILVER and BRONZE are used as shorthand descriptors for the three main levels in the hierarchy of managing the response. Fewer or more levels may be implemented depending on the size and complexity of the organisation and any external command and control arrangements into which the organisation needs to integrate.

One possible command and control structure for a multi-site blood service is depicted below:

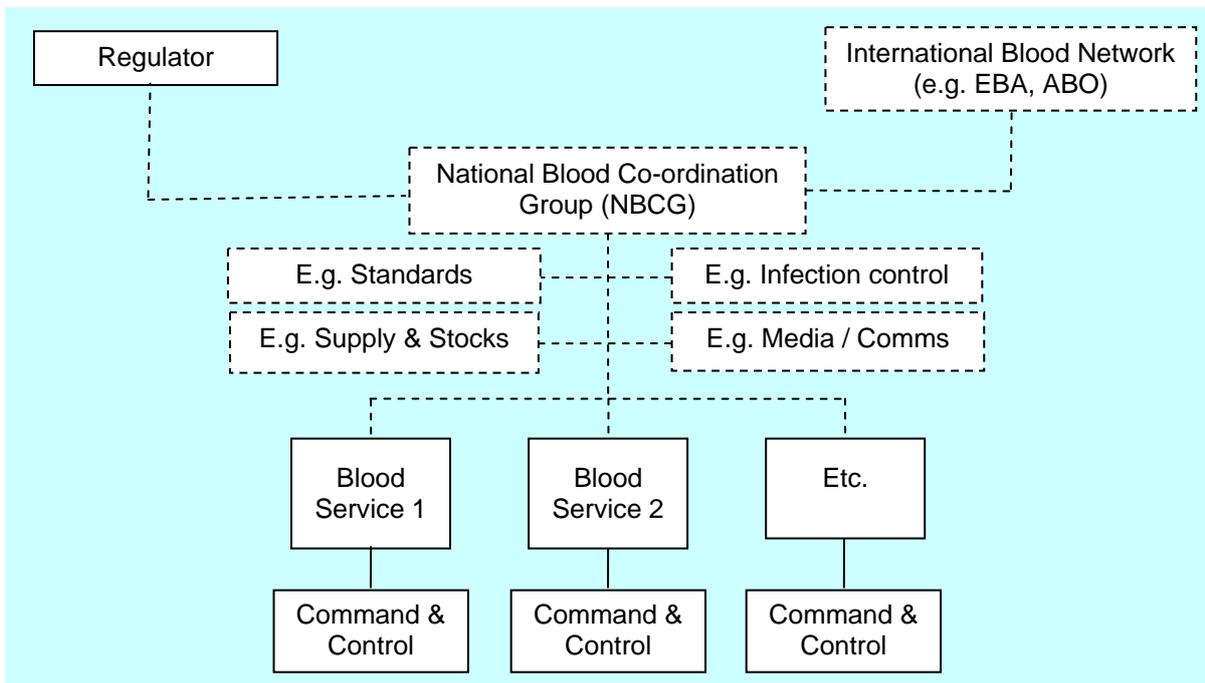


Note to figure: Solid lines show formal lines of accountability. Dotted lines show collaborations.

Depending on organisation size and complexity it may be appropriate to also establish small, expert groups to support the response and recovery groups. Standing committees may be used for this purpose where they already exist. The list below is not exhaustive but such groups might be asked to focus on areas such as:

- Infection control
- Intelligence gathering and modelling
- Guidelines and practice
- Communications
- Staffing and Human Resourcing
- Blood stock management
- Consumable stock management

Where a single blood organisation is responsible for the entire national blood supply, it's own command and control arrangements would need to be designed to ensure this co-ordination internally. Where there are multiple blood services, these arrangements would need to be in place outside of each blood organisation's individual command and control arrangements. The following schematic depicts how this might be organised:



Pandemic influenza will impact the whole country. In Europe, where individual countries occupy relatively small geographies and often have highly concentrated and mobile populations (commuting) it can be assumed that the pandemic will affect the whole country over approximately the same time period. Therefore, where there are several blood organisations serving a country, some form of national co-ordination is likely to be very important particularly in relation to:

- Standards of practice (e.g. donor deferral criteria)
- Highly visible infection control countermeasures (e.g. face masks)
- Blood stock and shortage management
- Media handling and media messages

The term “battle rhythm” describes the frequency and intensity of the response and is especially important in managing crises of long duration. An influenza pandemic will be such a crisis.

Assuming that intensified planning and increased preparedness takes place as soon as possible after the announcement of WHO 4/5, the blood organisation will then need to maintain a heightened state of readiness until WHO 6 is actually announced and the “pandemic proper” commences. Depending on the geographic location of the start of the pandemic and the success of early containment strategies, it is possible that WHO 4/5 would need to be sustained for a period of up to 6 months (or perhaps even longer). It will therefore probably be impractical and inappropriate to implement and sustain an intense daily battle rhythm at early phases of the emerging pandemic. Nevertheless, at WHO 4, planning and preparedness efforts will need to intensify significantly and mechanisms will need to be implemented that provide greater visibility and assurance of the state of preparedness of the blood organisation (and any other related blood services). A measured approach will need to be developed for intensifying the “battle rhythm” as the pandemic approaches.

It is suggested that from WHO 5 onwards, command and control arrangements are formally activated in the blood organisation working towards a daily battle rhythm when the pandemic is actually spreading through the Country. At each stage, the battle rhythm should be established by the CEO/Top Team (Gold) taking account of any requirements placed on them by any bodies into whom they will need to provide situation or status reports (e.g. national health department). The same rhythm should be established for all levels of the command and control and a regular reporting cycle established within each rhythm. Settling into a steady rhythm and formal system for reporting and implementing decisions early on in such a way as to be able to smoothly accelerate (and later decelerate) these will be important to ensuring a smooth and sustainable response.

Regardless of actual meeting frequencies, more frequent preparedness / situation reports can be generated and circulated if required. Reporting cycles should not force meeting cycles. Different types of reporting will be required at different points as the crisis evolves.

Modes of meeting will need to change as the pandemic evolves (a) in order to reduce face to face contact as an infection control measure and (b) to maximise efficiency as the pace of the response intensifies. Because mechanisms will need to adjust during the pandemic, it will be important to make changes to command and control arrangements just ahead of time in order that all key players can continue to operate most effectively. In a crisis at least, time spent in meetings limits the opportunities to deliver actions. Particularly in the early phases of the response, the blood organisation will require quality time between meetings for key players to support and motivate their staff, work on finalising plans, on increasing preparedness and on establishing detailed response action “menus” as well as fulfilling their obligations under the reporting arrangements.

Human resources is one of the key impact areas of the pandemic. The command and control effort and reporting requirements should not set out to be any more ambitious than is absolutely necessary to see through the response. It is crucial to understand that the more intense the battle rhythm, the more resources will be required to sustain this and the more likely will be early “battle fatigue”. It is very important to adopt an approach which is intensive enough, but not so intense as to be unsustainable through the crisis. The organisation’s senior team should bear in mind that it is highly likely that a significant proportion of their own number and of other levels of their command and control will be depleted by influenza and that this impact will co-occur almost exactly with the time when the most intense crisis response will be required (i.e. the pandemic peak).

**Battle rhythm - The table below sets out a possible response sequence and intensity as a starting point for planners:**

Phase / Alert Level	Blood Service Response	Who Leads?	Meetings	“Battle Rhythm”	Type of Reporting	Emphasis / Key Actions	Possible Duration
<b>WHO 3</b>	Planning & Early Preparedness	CEO & Emergency Planning Lead for Pandemic Influenza  National blood co-ordination group (NBCG) (if required)	Normal  Normal	Approx. 6 per year?  Approx. 3 per year?	Normal & Planning	Guidance → Plan / Monitor / Review Get into good flu /hygiene habits. Set consumable stock levels. Build preliminary resilience: <ul style="list-style-type: none"> <li>• Educate</li> <li>• Build appropriate consumable / material stocks</li> <li>• Healthy finished goods stocks (e.g. blood)</li> <li>• Face masks and other flu consumable stocks</li> <li>• Staff policies and planning</li> <li>• Consult on possible changes (e.g. Regulator)</li> <li>• Consider/test IT systems/changes required</li> <li>• Maintain key resilience (e.g. platelet pooling)</li> <li>• Exercise / improve plans</li> </ul> Develop preparedness reporting.	Unknown
<b>WHO 4</b>	Full Preparedness	CEO & Emergency Planning Lead  NBCG	Normal  Audio	Fortnightly  Monthly	Preparedness	Review and intensify planning. Implement preparedness reporting. Finalise and verify resilience: <ul style="list-style-type: none"> <li>• Increase blood stocks</li> <li>• Consumable stocks</li> <li>• Staffing policies and staffing levels / options</li> <li>• Refresher training</li> <li>• Intensify &amp; broaden exercising</li> </ul> Prepare preliminary specific response action list. (N.B. Involve Regulator etc.) Prepare for situation reporting (agree format).	1 - 6 months
<b>WHO 5</b>	Preliminary Response	CEO / Team  NBCG	Normal  Audio	Fortnightly  Monthly	Preparedness & Situation	Stand up command and control (all levels) “Clear decks” (e.g. secure projects at “safe points”). Maintain preparedness reporting. Build blood stocks, consider extending shelf life. Finalise format and rehearse situation reports. Review/implement preliminary response action list. Prepare escalating response action list(s). (N.B. Involve Regulator etc.) Confirm situation reporting format.	1 – 3 months

Phase / Alert Level	Blood Service Response	Who Leads?	Meetings	“Battle Rhythm”	Type of Reporting	Emphasis / Key Actions	Possible Duration
<b>WHO 6 (No cases yet in country)</b>	Escalating Response	CEO / Team	Normal	Weekly	Situation	Continue as WHO 5 but intensify. (Note: DH <u>may</u> initiate daily situation reports here) Review all policies / actions. Review / adjust escalating response action list(s). Hold ready.	4 weeks
		NBCG	Audio	Fortnightly			
		CEO / Team	Normal	Weekly	Situation		As above. Finalise escalating response action list(s).
<b>WHO 6 (First cases)</b>	Escalating Response	NBCG	Audio	Weekly			
		CEO / Team	Audio	Daily	Situation	As above. Communicate escalating response action list(s) including arrangements for decision-taking and implementation.	1 week
<b>WHO 6 (Clusters)</b>	Peak Response	NBCG	Audio	Daily			
		CEO / Team	Audio	Daily	Situation	Intense situation reporting. Implement action list(s) as necessary. moderated to stay proportionate to actual / forecast impact. Prepare for possible mass vaccination impacts.	15-17 weeks
<b>WHO 6 (Pandemic)</b>	Recovery Re-planning Restore to Full Preparedness	CEO / Team	Audio→ Normal	Daily→ Weekly	Situation & Preparedness	Controlled withdrawal of major response actions (in approximate “reverse” order). Restore workforce. Re-build consumable and blood / tissue stocks. Preliminary lessons learned, plan response improvements for 2 <sup>nd</sup> wave. Interim report for Board / Health department	4-26 weeks
		NBCG	Audio	Weekly			
<b>Post pandemic</b>	Stand down	Normal	Normal	Normal	Normal	Stand down command & control Full lessons learned Final report for Board / Health Department Revise / store pandemic plans	Indefinite

12.2 Prioritisation of activities

The blood service will need to re-prioritise its activities in order to focus on those which are most time critical and to maximise its capacity to perform these. In doing so, it will also need to take into account changes in demand for its services and re-deploy available resources to continue to meet these demands as far as this can be achieved safely. To do this the organisation will need to understand which of its activities or functions are most time critical. A Critical Activities Analysis can be prepared and approved by the management team in advance to assist this process. Such an analysis categorises the blood service’s activities into a number of groups with each group being given a criticality code. Where there is contention for resources between activities of similar criticality, these must be resolved with clinical input.

The criticality of each function (e.g. blood collection) could, for example, be determined using the following benchmark:

***If the identified function or activity is continuously unavailable (as a result of the emergency) for the lost time period\* stated then this loss will impact adversely and severely on the organisation and/or its reputation (at some time in the future).***

In the example below, four criticality categories have been defined and for each of the four categories a corresponding overall action response is indicated.

Criticality (High to Low)	Lost Time Period* (Recovery Time Objective)	Action in Severe Shortage of Capacity
1	<b>48 hours or less</b>	<u>Continue</u> with the activities if humanly possible.
2	<b>Between 48 hours and 1 Week</b>	<u>If all lower priority activities already suspended, consider stopping</u> these activities for short periods.
3	<b>Between 1 Week and 1 Month</b>	<u>Consider stopping</u> these activities for up to c.1 month and re-deploy staff to more critical activities
4	<b>1 Month or more</b>	<u>Stop</u> these activities for as long as necessary and re-deploy staff to more critical activities

*(Note: It is assumed that all activities in blood services are essential but that some are more interruptible than others).*

Due to their operating cycle, it may be possible for fractionation plants to adjust their production programmes around the actual / forecast availability of resources. This is less possible for blood component activities where regular, daily throughput is essential due to the component shelf life and operational life cycle. In some cases fractionation plants close down routinely for planned periods of 1-2 weeks once or twice per year. Depending on the timing of the pandemic it may be possible to bring forward or delay these normal shutdowns. However, even if this is possible, it is still important to remember that certain essential staff would be required on site during shut down periods.

By contrast, the majority of blood service activities involving the greater proportion of staff need to run more or less continuously. Generally, the volume or speed of throughput can be reduced where fewer numbers of staff are available but most activities cannot simply be stopped or suspended. In departments responsible for the collection, processing, testing and supply of labile blood components it will be especially important to operate flexible shifts and to redeploy staff towards those activities which are most time critical.

**Key points to consider in relation to prioritisation of activities include:**

- Differentiate activities and identify those which are most time critical.
- Build plans to re-prioritise resources towards those activities which have been identified as most time critical.

### 12.3 Communications

Protecting the reputation of the blood organisation through the pandemic requires both action and engagement with staff, stakeholders and the national and local media in order that the organisation's plans are explained, understood and reported positively. Maintaining the reputation of, and public confidence in, the blood service will be crucial to continuing to provide a service to donors and customers during and after a pandemic. Effective communication and support from the media will be crucial throughout. Communications with the donating public, those who could potentially donate, staff, clinicians, hospitals, regulators, the health department and other blood services will all be vitally important. A comprehensive communication plan should be produced which links in to government level communication plans. It is vitally important that the blood service messages are consistent with government and media messages and vice versa. Key messages should be developed for different stages of the pandemic.

Rapid, clear and concise communications will be required following the declaration of a flu pandemic. As the peak period of the pandemic approaches, more complex or specifically targeted messages may be required. These will need to be developed in advance as far as possible but they will also need to be modified and finalised as the actual scenario unfolds. Approaching and going into the recovery stage will require another set of messages and communications. Communications, therefore, need to change as the pandemic progresses and the approach needs to be flexible enough to respond to the actual pandemic impact rather than a pre-supposed one.

Communicating with staff is going to be equally important – it is vital that staff are aware of the changing situation and environment, what is expected of them, changes to working practices, processes and rules and the rationale for such changes.

The blood organisation will also need to work closely with adjoining blood services to ensure consistency of messages.

Some of the key communication themes will be around clarification and reassurance, the importance of continuing to collect blood/platelets, any modifications to practice or donor selection guidelines, the need to be flexible, the important role of staff, workforce plans and arrangements, and health and safety.

An example framework for summarising communication messages derived by the EBA EPAG is included at Appendix 5.

#### Key points to consider when planning for communications include:

- Ensure key stakeholders are identified and understood.
- Make the connection between influenza and risks to the blood supply.
- Prepare a communication plan and draft key messages in advance.
- Review and adjust messages as the actual pandemic emerges and develops.
- Ensure consistency with central government and public health messages.
- Ensure consistency with adjoining blood organisations.
- Seek to ensure blood donation is included in central government messages.
- Use appropriate channels for communication.
- Be prepared to explain key issues and any changes and their rationale in detail.

#### 12.4 Recipient safety and donor deferral

In general, when a pandemic is widespread amongst the local donor population it is not considered that transmission of influenza via blood transfusion is a significant additional risk to transmission via other routes.

However, the normal donor deferral criteria in relation to infectious diseases may require review, clarification and/or modification at various stages of the pandemic.

**Key points to consider about recipient safety and donor deferral include:**

- All donors with any signs and symptoms of influenza or other illnesses should be excluded from blood donation sessions preferably using measures that will discourage them from attending in the first instance.
- Any donors with any such signs or symptoms who do attend should be identified and politely excluded at the earliest opportunity at the blood donation session (triage).
- A widespread, severe pandemic will have a significant adverse impact on the available blood supply.
- The donor deferral criteria applied may need to vary several times as the pandemic emerges, progresses and declines.
- The donor deferral criteria applied should, where possible, be linked to authoritative sources of information about the characteristics of the pandemic.
- Some donor deferral criteria are set out in EU and/or national laws.
- Some normal deferral criteria will need closer definition than usual and careful communication. For example, when there is widespread disease in the community, the definition of what would constitute “recent contact with an infectious disease” will need careful attention.
- Other donor selection criteria relating to infectious diseases may need to be differentiated from those being applied for the pandemic virus. For example, “any known or suspected recent contact” with, say, measles or similar diseases would probably still be grounds for deferral whereas for influenza perhaps only “recent close household contact” may be appropriate.
- Around the pandemic peak, most people are likely to have had some degree of contact with influenza (and/or to believe that they have had such contact).
- Depending on the incubation period, it is highly likely that donors who report influenza illness several days following donation will have acquired their infection after donating blood. Recalling of donations based on post donation illness may result in the loss of large numbers of good donations.
- Modelling suggests that applying the normal donor deferral criteria relating to infection for pandemic influenza around the disease peak could lead to an almost complete absence of blood donors.
- At some stages in the pandemic, limited geographic or travel deferrals may be appropriate but as the pandemic reaches its zenith these are unlikely to be applicable (see below).

- Far greater numbers of people than normal will have taken or be taking antibiotics or anti-virals including some who may be taking the latter prophylactically.
- Special arrangements may need to be made to select blood components for recipients which may be at higher risk (e.g. immuno-compromised) than the majority of recipients.

Donors who have recently recovered from influenza and are fit and well are likely to be donors with the lowest risk of passing on influenza.

**Key points to consider in relation to potential donor deferral include:**

Taking due heed of the relevant regulations and in consultation with their Regulator, blood organisations should therefore carefully consider and have carefully worked out plans to adjust, where appropriate, the following deferral criteria in a pandemic:

- (N.B. It is assumed that all symptomatic persons will definitely be excluded).
- Recovery period post influenza-like illness.
- Recent contact with infectious diseases.
- Recent / current medication.
- Post donation illness reporting and actions arising from this.
- (Geographic and travel criteria – at certain times only)

During the earlier or later phases of the pandemic it may be possible to determine an increased risk of potential donors having had contact with influenza from their geographic distribution or recent travel behaviour. In addition, since the strategic objectives of governments in these stages may be to contain the disease and/or reduce the risk of a subsequent wave it may be desirable for the blood organisation to contribute to this process by implementing some form of additional donor deferral criteria. This will depend on the known characteristics of the disease, the relationship between the blood service and the location and geographic spread of the outbreak and estimations by the blood service of benefit versus risk to the blood supply. Such donor deferrals will need to be kept under regular review as the risk versus benefit estimate is likely to shift substantially as the pandemic emerges, spreads, peaks and passes through.

### 12.5 Maximising and managing the available supply

Blood services need to actively connect “influenza” with “a blood supply at risk” in the minds of the donating public.

Effective and timely communication with blood donors, hospital customers and key suppliers will be crucial to optimising the blood supply during the pandemic. The blood organisation should aim to boost blood stocks as the pandemic approaches and continue to encourage blood donation throughout the pandemic wave. The extent to which stocks are boosted and the mechanisms for achieving this will depend on actual stock levels at the time, the general sense of public behaviour and attitudes and the available storage capacity. As a guide, the aim should be to boost and hold higher stocks from WHO 5. Care will be required to balance blood groups when actioning this and to ensure very effective stock rotation is in place in order to ensure consistent age of blood at time of issue.

The ability of the blood organisation to maintain the blood supply given the potential impact on donor attendance will depend considerably on the underlying resilience in the donor database, and the use of that database. As a key part of its preparation for a pandemic, the blood organisation should take steps to review and understand this key area of its business and take appropriate steps to improve its donor database ahead of the pandemic.

#### Key points to consider to improve donor availability include:

- Increasing donor recruitment / % of population giving blood
- Creating emergency donor panels / donor reserves
- Reviewing the acceptable donor age range
- Reviewing the minimum Hb levels for donation
- Modifying the minimum donation interval
- A combination of increasing the total number of donors available and reducing the average frequency at which they give routinely ahead of the pandemic could create more capacity to increase donation in the pandemic by then reducing the normal donation interval. This is counter-intuitive for blood organisations who normally work towards operating with fewer, more frequent blood donors.

As infected persons begin to recover from influenza, the blood organisation should particularly seek the support of these blood donors because their natural immunity will further reduce any risk of influenza transmission via blood service activities.

Considerable efforts have been applied to modelling the possible impact of a pandemic of various severities on the blood supply and, in some countries, to developing tools for following the evolution of the pandemic as it impacts on the blood supply in “real time”. Each blood organisation will need to ensure that it has access to good intelligence and data about both the pandemic and the blood supply and respond to its best near future predictions of available supply. Failure to manage the pandemic in this way is likely to lead to too little action being taken too late. Where a country is served by a number of separate blood organisations, consideration should be given to co-ordinating blood stocks nationally in order to provide equality of service to citizens.

At certain times in the pandemic, particularly at or near the peak, platelet supplies are likely to come under particular pressure because many blood organisations rely heavily on (apheresis) donation programmes which depend on relatively few donors giving several doses of platelets regularly. It is noteworthy that some countries who have moved to 100% apheresis sourced platelets are moving back to a mixed production model due to concerns over too much reliance on one methodology. The loss and deferral of a significant proportion of these donors due to influenza illness can have a very significant impact on supplies. Maintaining platelet supplies around the pandemic peak should be a particular focus of any blood organisation’s pandemic plan. There is no magic solution to the platelet supply challenge.

**Key points to consider to improve the platelet options include:**

- Educate donors as to how they might minimise their own risk of catching influenza.
- Careful and clear communications with regular platelet donors encouraging even more regular giving and urgent return to donate after recovering from influenza.
- More frequent donation intervals than normal.
- Apheresis donation by whole blood or plasmapheresis donors who might not normally give in this way or may not wish to for the long term.
- Establish some capability to manufacture platelets from whole blood if none currently exists.
- Increase the proportion of the whole blood supply which is converted to platelets.
- Consider extending shelf life of platelets to 7 days (with bacterial screening) to increase the proportion of the available supply which can be used and not wasted due to time expiry where this would yield net benefit (see below).
- Change ordering / supply patterns to hospitals (move more to supplying platelets on demand where they are currently ordered and held by hospitals “just in case”).

- Work with hospitals to use fewer doses per patient where possible.
- With high quality platelets and for some recipients full blood group compatibility may be less important than for others.

Some consideration should also be given to encouraging donors to get regularly vaccinated against seasonal influenza and to helping donors get priority access to a pandemic vaccine when it is available and, perhaps, to the possibility of anti-viral prophylaxis for priority donors. However, this latter is fraught with difficulties and needs very careful consideration and handling. Most blood organisations are not currently planning this. The most likely practical benefit of anti-viral prophylaxis could be to help “time shift” the loss of some donors at the pandemic peak as, in a pandemic, most persons who take a course of anti-virals for prophylaxis are likely to be just as susceptible to influenza when they stop taking the medication.

In the event that insufficient blood can be collected and blood supplies are forecast to fall to dangerously low levels, then blood organisations need to be ready to manage blood shortages and all blood organisations should establish mechanisms for doing this. To operate effectively such plans need to cover all blood components and must be developed, trained and tested in collaboration with hospitals and health authorities and they therefore take a long time to put in place. Their potential importance in a pandemic and in other situations which could lead to blood component shortages cannot be over-estimated.

A check list to help blood organisations to develop blood shortage plans is included at Appendix 9.

One of the first countries to develop such plans is the UK which has integrated blood shortage plans (for red cells and platelets only at this stage). These plans can be found via the table of references in Appendix 1.

In other emergency planning contexts, consideration has been given to the possible bulk storage of frozen red cells which can have a shelf life of up to 10 years. This technology is used routinely on a small scale for rare red cell types. However, aside from the very significant operational and financial consequences of such a depository, previous work generally ruled this out due to the physical space, resources and particularly the time required to thaw sufficient cells for use. Certainly, this last is a major obstacle to providing an entire blood supply in this way. However, if operated on a smaller scale and in a targeted

way (e.g. skewed towards group O or to provide blood for immuno-compromised patients), it might be feasible to partially supplement a diminished blood supply using such an approach.

**Key points to consider for maintaining and managing blood supplies include:**

- Aim to meet demand for life saving products and services throughout.
- Carefully monitor the health service response and changes in activities for potential impact on demand for blood products and services.
- Implement forecasting and management tools for blood stocks.
- Ensure that blood shortage management plans are in place.
- Manage available stocks at national level in order to ensure equitable treatment of whole population according to need.
- Be prepared to implement the conservation aspects of blood shortage plans based on forecast rather than actual stocks to preserve supplies.
- Concentrate attention on most life and time critical products, services and activities – stock up in advance where this is possible.
- Establish robust routine stocks of long shelf life components. Some countries hold up to 6 months stock of clinical plasma. Take into account the source of the plasma when planning stock levels. Where clinical plasma is obtained via a third party, the blood service is less likely to be in direct control of supply in a pandemic situation (see also section on consumables).
- Building a more resilient donor base now will provide much improved capacity to maintain supplies in a pandemic.
- Maximise the number of donors available in the pandemic.
- Increase blood stocks just ahead of the pandemic:
  - Take account of storage capacity limitations.
  - Take care to achieve an appropriate balance of blood groups.
  - Effective stock rotation (FIFO) and co-ordination will be essential.
  - Communicate carefully with hospitals who could otherwise start reducing their own stocks as a result of older blood being supplied when blood service stocks increase.
- Anticipate the possibility of hospitals sending additional diagnostic work to the blood organisation as they respond to the pandemic themselves.
- Consider increasing the available shelf life of shorter life components (red cells and platelets) in order to improve stock flexibility. Careful communications with end users in hospitals are required if these changes are made. Note that:

- Improving red cell shelf life is unlikely to increase the overall available supply especially if stocks are low. The best time to increase red cell shelf life and have an impact would be just before stocks are boosted ahead of the pandemic to minimise risk of waste at times of high stocks.
- Bacterial screening of platelets does not necessarily increase the available shelf life at point of issue. It may not be worth extending platelet shelf life if the consequences are that more staff are required in order to undertake bacterial screening and there is no real extension of available life at point of issue.
- Importation of blood components from other services may be possible but this is considered unlikely because most countries producing blood components from equivalent populations and to equivalent standards are likely to be affected to a similar extent at a similar time. However, if there are countries which are relatively unaffected at the time when yours is worst affected or who are being especially successful in boosting their own blood supplies, this possibility should not be fully ruled out. Exploring this option via the international emergency planning network and CEO contacts (e.g. Alliance of Blood Operators, European Blood Alliance, Asia Pacific Blood Network) would be recommended in these circumstances.
  - Care should be taken not to deplete supplies in other countries ahead of them facing the pandemic for themselves.
  - The government should be kept closely informed. Importation of blood could have political ramifications.
  - Take account of practical obstacles due to the lack of standard blood component specifications and, in particular, labelling.
  - Do not import blood that is unlikely to be used.

#### 12.6 Donor safety and availability

The public/donor perception of what will constitute a “safe donation environment” will vary greatly depending on government policy, the public health message and the prevailing behaviour of the general public. Even so, actual expectations are quite unpredictable. These public expectations will be key and are likely to change during the pandemic. They will need to be carefully monitored and, as far as possible, flexible plans put in place to respond to such changes.

Blood organisations should aim to provide an environment for blood donation which is safe and, importantly, perceived as safe by blood donors to encourage the continuation of donation. All blood organisations are planning to implement additional hygiene and infection control measures at blood collection sessions although the nature and extent of these vary widely between countries. Additional personal protective equipment and, in particular, face masks are a key consideration. A careful review of available national policy and guidance, anticipated blood donation arrangements and a formal risk assessment are the preferred mechanisms by which each blood organisation should establish its plans in this regard.

Regardless of infection control measures which may be deployed, it is essential that persons who may be infectious are excluded from blood collection venues as far as is possible. This could involve making significant changes to the way that donors are invited to blood collection sessions, to the arrangements for meeting donors on arrival and to the flow of work through the blood collection venue. It will be a key action to ensure that donors who are unwell do not attend blood collection sessions. Donors may also be discouraged from bringing accompanying persons (e.g. children).

**Key points to consider about the donation environment include:**

- Exclude all unwell or unnecessary persons.
- The environment for donors that a blood organisation creates during a pandemic will be key to maintaining the confidence of donors and therefore the blood supply
- The optimal environment should be determined and designed to be consistent with local public health plans and resulting public expectations.
- Donors and staff should be consulted and their views taken into account at the planning stage and subsequently as the pandemic approaches. The blood organisation needs to match public and donor expectations throughout and these expectations could change.
- Supplies of infection control materials may be more difficult to obtain in a pandemic and therefore, if they may be required, stocks should be secured in advance of the pandemic.
- The nature and timing for implementation and cessation of changes to the donation environment may be best linked to other equivalent providers of public services in the same locality (e.g. outpatient clinics).

Amongst the blood organisations who have participated in the preparation of this document the table below will give an indication of the main areas of similarity and difference in this area:

	Least intervention	Greatest intervention
Approach to session	No change	Hold donors outside session and encourage distancing between donors while waiting outside.
Number of donors in session	No change	Limit number of donors allowed to enter.
Check donors for infection	Triage station prior to entry.	Temperature and triage station prior to entry.
Donors own clothing	No change	Remove outer garments and place in bag before entry.
Gowns for donors	No change	Provide disposable gowns for all donors.
Hand disinfection for donors	Sanitising hand gel before entry.	
Gloves for donors	No change.	
Eye protection for donors	No change.	
Face masks for donors	No mask	Surgical mask
Distancing between persons (where practice makes possible)	Maintain minimum 1m	Maintain minimum 2m
Disinfection between donors	Disinfect donation couches between donors.	
Check staff for infection	Triage station prior to entry.	Temperature check and triage station prior to entry.
Staff own clothing	No change	Remove outer garments and place in bag before entry.
Gowns for staff	No change.	Provide disposable gowns for all staff.
Hand disinfection for staff	Regular disinfection with sanitising hand gel.	
Gloves for staff	No change.	Surgical gloves for all staff.
Eye protection for staff	No change.	Eye protection for all staff.
Face masks for staff	No face masks for staff*	FFP2 masks for all staff.
*Some services are considering surgical face masks for triage (greeting staff) only.		

Most services who are known to be planning have made preliminary decisions (reflected above) but many are still considering this difficult area and most are intending to create and maintain some flexibility in their plans.

key basic messages for blood donors are likely to include:

- **If you are unwell do not try to come to give blood.**
- If you are fit and well please come to try to give blood.
- Please help to maintain our life-saving services.
- Expect some important changes to our practices and procedures (give details).

In the event of severe shortfalls in blood donation, blood organisations may want to consider relaxing their normal donor selection or deferral criteria depending on pandemic severity provided this can be achieved without compromising patient or donor safety and any potential legal or regulatory issues can be satisfactorily dealt with. We refer organisations to the document published by the Blood Regulators Network, *Donor selection in case of pandemic situations*. (The reference to this key document can be found in Appendix 1).

Key points to consider in relation to donor safety and availability include:

**Implement a range of precautions (for donors and staff):**

- Correct messages for donors (see above) through all available channels.
- Correct messages and training for staff (see below).
- Revised donor invitation letters/messages.
- Contacting donors by phone before their appointment to ask them if they or their immediate household contacts have any symptoms and advising action accordingly.
- Warning posters at session entry points.
- Triage of donors on arrival for symptoms.
- Reinforce hand washing and respiratory hygiene.
- Appropriate use of PPE depending on expert guidance and, at least as importantly, public expectations.

**Avoid unnecessarily crowded donor sessions by:**

- Where possible use larger venues for more space and segregation between donors.
- Arranging the waiting area to minimise donor to donor and staff to donor contact.
- Call as many donors as possible by appointment but donors also to be encouraged to donate using all options available.
- If resources permit, call fewer donors at any one time but open sessions for longer.
- Only call local people to local sessions (i.e. to reduce travel) and be aware that work place sessions are likely to be cancelled due to staffing impact on businesses.

Despite all of these efforts, very significant reductions in the number of donors are still likely and blood supplies will come under very significant pressure.

**Increase the number of donors / donations available by:**

- Proportionate and timely promotion of need for donors and of donor sessions.
- Minimising the deferral of donors including in relation to flu.
- Consider reviewing and amending normal donor selection criteria:

- Only change normal criteria if proportionate to predicted or actual impact.
- First, amend criteria within guidelines / law.
- Second, before considering amending outside guidelines / law ensure other measures are in place to maximise and stretch the available supply (e.g. blood shortage plans).
- Third, consider amending other criteria (in consultation with regulator).
- Targeting donors who have recently recovered from pandemic flu. There could be other sub-populations to target, such as emergency service personnel who may be vaccinated earlier than the general population or groups who may be given anti-virals for prophylaxis by their employer (subject to them being accepted for donation while on this medication).
- Increase the number of donors giving platelets by apheresis including considering the donor selection criteria for this and for those donations which can be converted into pooled platelets (e.g. use of first time donors).
- Consider collecting all donations into platelet production bags (except those which are unsuitable for platelets) around the pandemic peak to increase the opportunities to make platelet pools from whole blood.
- Liaise regularly and closely with local authorities and venue contacts to minimise the impact of any potential loss of venue availability. Consider the possibility of backup or emergency venues. Plan for the risk of potential competition for blood collection venues which may arise in the event of mass vaccination (note that if this occurs it is likely to be after the peak disruption period).

### 12.7 Staff safety and availability

Key basic messages for staff and contractors are likely to include:

- **If you are unwell do not come to work.**
- If you are fit and well come to work.
- Be prepared to work differently or be re-deployed if necessary.
- Please help to maintain life-saving services.

Consideration will need to be given to ensuring consistency and/or explaining inconsistency between messages for staff and for others such as blood donors. For example, if blood donors are being asked not to attend sessions if they have had recent household contact with a person with influenza then consideration also needs to be given to whether or not the same message is appropriate for staff or, if not, to explain why not.

All blood organisations will be aiming to provide a safe environment for staff and contractors. Ideally, pandemic specific workplace risk assessments and action plans would be completed and agreed jointly by management and staff with involvement from Trades Unions where appropriate. Encouraging employees and contractors who are fit and well to attend work and ensuring that those who are ill stay at home will be key actions for all employers. It will be essential to maintain a healthy work environment and to generally raise the level of hygiene and good health practice amongst staff and contractors. In a pandemic, this will probably include revised control over entry to, and exit from, blood service premises and collection venues with “triage” points and hygiene stations on entry.

Poor hygiene awareness and practice is generally commonplace and bad habits will be hard to change in a pandemic. Therefore, for example, running annual seasonal flu awareness, vaccination and hygiene campaigns could help significantly to develop better habits amongst employees and contractors now which could both help to reduce the transmission of seasonal illness and absence in the organisation and improve preparedness for pandemic influenza.

Blood services will need to consider how to minimise absence (including requesting staff to defer planned absence) and to maximise flexibility so that limited resources can be targeted where most needed to keep life saving services operating. They should also encourage and expect any contractors to adopt similar approaches.

If the organisation has identified and documented its most time critical activities (see earlier) then during the response phase departmental managers will be able to use this analysis to consistently prioritise the most essential and time critical activities and be prepared to seek help from, and to help out, other departments. Recent retirees and agency staff can be asked to assist where available and should be identified and approached beforehand. A staff emergency re-deployment policy should be developed and agreed with Trades Unions. Although there is the theoretical possibility of seeking qualified staff from elsewhere in the health sector, it is safest to assume that in a pandemic any spare capacity in the wider healthcare community is likely to be more importantly focused elsewhere. Contractor redeployment will primarily be the responsibility of their employer but the blood organisation should work with them to ensure that contractor services will be maintained. This may require the blood organisation to be as flexible as possible in assisting contractors to achieve this. Non-essential personnel such as visitors may be politely excluded from the premises.

In concept, the blood organisation's pandemic influenza staffing strategy should be to focus the management of its human resources around its most critical activities at local level. Travel between sites may need to be minimised and it should be borne in mind that re-deploying staff between locations may assist the spread of the pandemic and add to anxieties amongst staff's families. Increased use can be made of telephone conferencing (especially if already widely used), internet meetings and video-conferencing facilities. Remote (e.g. home) working can also be increased where appropriate. This latter must be handled carefully however, as visible leadership and fairness to all staff are vitally important aspects of the response. If expert advice or support is no longer available locally due to illness, if possible it should be provided at distance by telephone and email. For certain expert functions which rely on very small numbers of "hands on" staff it may be necessary to redeploy between sites on an exceptional basis. As a general principle though, in a pandemic, re-locating work is preferable to re-locating persons.

Some countries have a legal framework through which key workers can be obliged to attend work. Where these exist, such frameworks are expected to be deployed as applicable to blood service personnel in line with their application in the wider healthcare community.

**Key items to consider in relation to staff safety and availability include:**

- Visible leadership.
- Correct messages for staff and contractors about attending work.
- Education and training for staff ahead of the pandemic. The training of contractor's staff will be primarily a responsibility of their employer but the blood service will need to provide any training specific to contractor's needing to work differently on its sites and could consider providing access to its training materials / courses for contractors.
- Seasonal flu vaccination programmes for staff.
- Create detailed departmental plans for operating with fewer staff resources (e.g. 10%, 20%, 30% fewer staff and test these plans).
- Generally improve multi-skilling and cross departmental staff rotation and training where possible.
- Hygiene and respiratory hygiene training (but note that persons with flu symptoms must not attend the workplace).
- Reduced entry and exit points to sites.
- Hygiene stations at entry and exit points.

- “Triage” of staff and contractors on arrival at work (including the possible use of face masks by “triage” staff in case symptomatic persons present for entry).
- Minimise planned absence and defer annual leave where possible.
- No visitors.
- Only essential contractors.
- Scrupulous personal hygiene especially hand washing / sanitisation.
- Staff or contractors taken ill on the premises to be escorted safely away from premises with appropriate support (e.g. ill person provided with face mask).
- Effective building cleaning regimes.
- Keep air-conditioning units operating (increase “fresh air” content if possible).
- Minimise / eliminate face to face meetings and all non-essential travel.
- Reduce inter-centre movements to a minimum
- Concentrate available resources on most critical products, services and activities.
- Local management of staff resources and local redeployment to critical activities as necessary. Necessary basic training and supervision to be provided to all redeployed staff. Local redeployment management arrangements to include those staff in a locality who may not normally work on site.
- Arrangements for staff reporting sick (and/or for duty) need to be in place and it may be helpful to establish some form of central bureau administered by human resources for handling work attendance and redeployment.
- Regional or national redeployment only if local solutions cannot be found, work cannot be supported remotely (e.g. by phone advice) or the work (rather than the person) cannot be transferred.
- Sensitive handling of redeployment issues. Consideration of the implications for staff members of redeployment. For example, redeploying or allowing staff to decline redeployment requests because they are concerned about their own welfare would impact other staff who would have to cover those duties. Staff required to travel and stay away from home as part of redeployment likely to be under additional pressures as a result.
- Support staff with ill persons at home or children sent home from school due to school closures, e.g. by flexible rostering.
- Adjust working patterns where this will help the organisation and/or staff or contractors.
- Provide appropriate counselling support facilities for staff.
- Assume that working time regulations will still apply.
- Sickness certification arrangements may change. (Follow government guidance).

- Remote working where possible but only for those staff who can perform critical activities remotely and/or who are not required on site for their normal duty or to be redeployed to a critical activity.
- Seek additional staff from agencies, recent retirees, universities (if closed) and other local organisations but expect few to be available in reality.
- Staff recruitment. Urgent staff replacement (temporary and some permanent) is likely to be required. Speed up or bring forward recruitment processes. Note that pre-employment checks could be particularly difficult around the pandemic peak. Organisations who provide this information are likely to be short of resources.
- Plan and implement work attendance reporting systems to ensure staffing operational status can be monitored, assessed and communicated.
- Seek prioritisation of blood service staff as healthcare workers.
- Identify the front line group(s) of essential staff who should receive pre-pandemic, or pandemic specific vaccine at the first opportunity if blood organisation staff are given agreed priority at any stage.
- Consider how blood service workers would be prioritised If anti-virals are available to healthcare workers for prophylaxis. For planning, from the situation in most countries, it is assumed that anti-virals will not generally be available to blood organisation staff for prophylactic purposes.

### 12.8 Consumables and supply chain resilience

All blood organisations are encouraged to ensure that they have identified all of the truly critical consumables on which their services depend and the suppliers who provide these. A critical consumable is one without which the blood supply will cease and for which there is no readily available alternative. So, for example, blood packs are a specialised component and without a blood pack there is no donation. By contrast, refreshments for blood donors are important but, in an emergency, their absence will not prevent donation and basic alternatives are usually readily available (e.g. drinking water). Distinguishing between these different types of consumables helps the organisation create a manageable list of items to concentrate on in order to develop and implement cost effective, risk management based, stock management policies.

A number of blood organisations have surveyed key suppliers of their critical consumables. Other blood organisations are encouraged to do so and for this purpose the survey format is included at Appendix 8. The more blood services ask questions of suppliers, about emergency preparedness in general and pandemic preparedness in particular, the more suppliers will be encouraged to plan and prepare themselves. Those services who have

surveyed their suppliers and obtained responses have generally concluded that suppliers will not guarantee supplies in a pandemic. Suppliers can be required contractually to hold certain minimum stock levels on behalf of the blood organisation and to provide evidence of their own pandemic or business continuity planning processes and plans. Such information helps to assess risk but it does not in itself guarantee continued supply in a global pandemic.

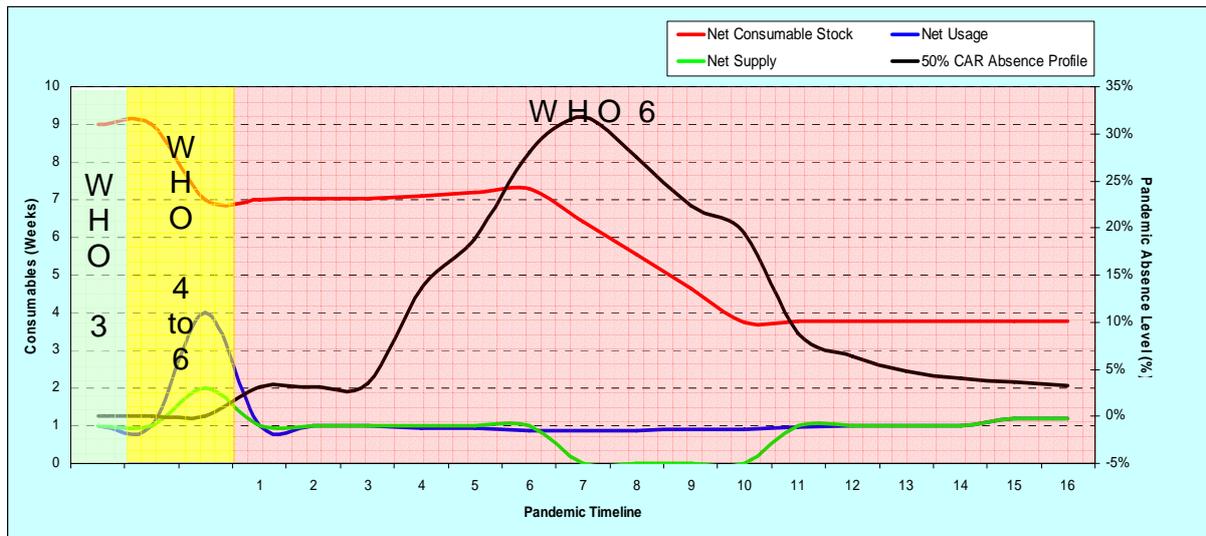
It will be essential to ensure that the supply of the blood organisation’s products or services are not compromised for want of critical consumable supplies at any stage. In the majority of cases consumables have a long shelf life (notable exceptions: liquid nitrogen, dry ice etc). They can therefore be held in sufficient quantities so as to ensure they do not become the supply chain bottle neck in a pandemic. This is not without consequences in terms of space, cost and routine efficiency and each blood organisation must come to its own view on the most appropriate stock holding policy for itself.

Due to the likely impact of a severe pandemic on critical consumable suppliers, the need to be able to boost blood stocks just ahead of the pandemic peak (which will require extra consumables), the likely “competition” to stock up at WHO 4 and the possible short duration of WHO 4/5, it has been estimated that to survive the pandemic, baseline stocks at the start of the pandemic need to be approximately 8 weeks. Whilst no estimate can be precise or guaranteed this level should help the blood organisation to emerge from the pandemic with reasonably robust stocks in order to re-build blood stocks as rapidly as possible:

<b>Consumable Stock Targets : Pandemic Flu Estimates</b>	<b>Weeks stock</b>
Stock target at WHO 6	8 weeks
Plus extra needed to build blood stocks in WHO 4/5	3 weeks
Less net reduced usage over pandemic wave	1 week
<b>Total stock required (at normal usage rates)</b>	<b>10 weeks</b>
Less extra stock built in WHO4/5	1 week*
<b>Minimum stocks to be held now (WHO 3)</b>	<b>9 weeks</b>

\*Only 1 week due to order/supplier lead time, “backlog” effect & potential competition for supplies

The graph maps the possible use of a typical consumable which varies directly with activity (e.g. test kits for blood donations where every donation is tested). It shows the early over-usage as blood stock levels are built (peak on blue line) which cannot be matched by additional manufacture due to the relatively short potential notice period. It also shows the possible “hole” in supply (trough on green line) and the possible evolution of stocks (red line) of a typical consumable during the pandemic.



Some consumables are likely to vary differentially in the quantity used as a direct or indirect consequence of the pandemic (e.g. to obtain enough platelets, there may be an increase in platelet production from whole blood). These effects will overlay additional challenges to the amount of consumables required ahead of and during the pandemic which need to be factored into the above approach. As in other areas of this plan, it will be very important to monitor the actual situation as it unfolds and adjust actions (and orders) accordingly.

Consideration must also be given to those consumables which are specific to the pandemic and which are either not normally used at all by the blood organisation (e.g. face masks) or which will be used in significantly increased quantities as a direct result of the pandemic (e.g. sanitising hand gels). Face masks are a special case and, depending on the policy being adopted, detailed analysis and stock holding arrangements need to be considered. Blood organisations expecting to use face masks in large quantities in the pandemic would be wise not to leave acquiring all of their stocks until WHO 4 when every other organisation may well be trying to acquire stocks also.

**Key items to consider in relation to consumables include:**

- Develop and maintain policies, procedures and systems for setting and monitoring critical consumables stock levels for the pandemic and at WHO3 (i.e. now).
- Ensure firm (contractual) access to sufficiently resilient stocks of consumables.
- Factor in probable/possible pandemic specific changes of consumable usage and adjust stock preparedness accordingly.

- Depending on your policy, stock-pile face masks and any other flu specific PPE / consumables which do not get used as a matter of routine in appropriate quantities and keep these stock-piles appropriately refreshed.

### 12.9 Equipment and infrastructure

Generally, countries are assuming that basic national and local infrastructures will continue to be available and accessible to organisations throughout the pandemic. National and local planning guidance should be reviewed to confirm this in your context.

Areas for consideration include:

- Will international borders remain open for import and export.
- Fuel supplies.
- Power and energy supplies.
- Mains water and sewerage.
- Clinical and general waste disposal including incinerators.
- Telecommunications (including mobile telecommunications).
- Information technology (particularly own services and internet connectivity).
- Public and commercial transport, road, rail, air, sea and related infrastructures.
- Emergency services cover (e.g. in event of fire).

Blood organisations should consider bringing forward vehicle and equipment maintenance schedules as the pandemic emerges to reduce risk of breakdown and avoidable reliance on vehicle and equipment engineers during the pandemic. In the pandemic, only high priority maintenance work would probably be carried out upon equipment which the organisation depends for its supply chain or for health and safety.

Blood organisations are encouraged to develop and test plans and agreements to enable them to relocate work rapidly and smoothly to other locations or blood services in case of their own premises or equipment failing or being at risk in any one of their major locations. This is especially important for situations where the organisation is reliant on very small numbers of large items of equipment (e.g. blood testing equipment, IT systems).

It is important to ensure that there are specific business continuity and pandemic influenza plans in place for critical IT services to ensure that basic services can be maintained and where it is part of the plan to depend on enhanced IT services (e.g. increased in remote IT access).

Blood organisations should understand national and local plans for emergency access to fuel and energy supplies etc. where these exist and, where possible, ensure that they are identified in any priority schemes.

Many organisations are heavily dependent on contract staff for cleaning and waste disposal. During a pandemic, these resources are likely to be under severe pressure due to illness, pressure to work elsewhere and additional cleaning duties to improve hygiene standards in buildings. This area will need particular attention by the blood organisations facilities or house services departments and it may additionally be necessary for some blood service personnel to be redeployed temporarily to perform cleaning duties (see also section on staffing above).

**Key items to consider in relation to infrastructure include:**

- Maintain close watching brief on forecast / actual infrastructure provision and adjust response accordingly.
- Where key services are outsourced (e.g. transport) develop specific contingency plans in conjunction with the service provider for those services.
- Bring forward maintenance schedules for vehicles and equipment as the pandemic approaches.
- Review and consider holding critical spares locally (either with supplier/agent or in blood organisation)
- De-prioritise all non-essential maintenance work during the pandemic itself.
- Defer implementing major new equipment or systems until after the pandemic where possible (new equipment may initially be less reliable than old and may require additional resource to implement and/or resolve teething problems).
- Ensure IT resilience (e.g. backup arrangements) are maintained throughout.
- Ensure arrangements are in place to extend IT or communication provision where this is part of your plan.
- Seek priority access to energy and fuel supplies and stock up with fuel and other supplies where possible / appropriate.
- Devise and implement new and/or more frequent cleaning regimes to improve hygiene standards and plan effectively for how these will be implemented and maintained.
- See earlier for arrangements for staff and contractor access to premises and requirement to keep air-conditioning units operating.

### 12.10 Finance

It will be key to maintain adequate financial resources through and beyond the pandemic in order to be able to continue to pay suppliers and staff. Failure to pay either to time is likely to magnify the adverse impact of the pandemic on the blood organisation. The blood service will need to liaise carefully with relevant stakeholders and funding bodies about how it will maintain its cash flow during a pandemic.

There is likely to be an increased call on cash just ahead of the pandemic due to a “stocking up effect” including, for example, the bringing forward of vehicle and equipment maintenance. Some of these additional costs will be offset to some extent by not being required at a later date. One option to consider carefully is the financing of stocks of consumables and how, if effective stocks are built in advance, this could potentially reduce the cash required at a later date as these stocks are consumed. As the pandemic approaches, some consideration should be given to triggering general savings in order to reserve funds to pay for the most essential items during the pandemic itself.

#### Key items to consider in relation to finance include:

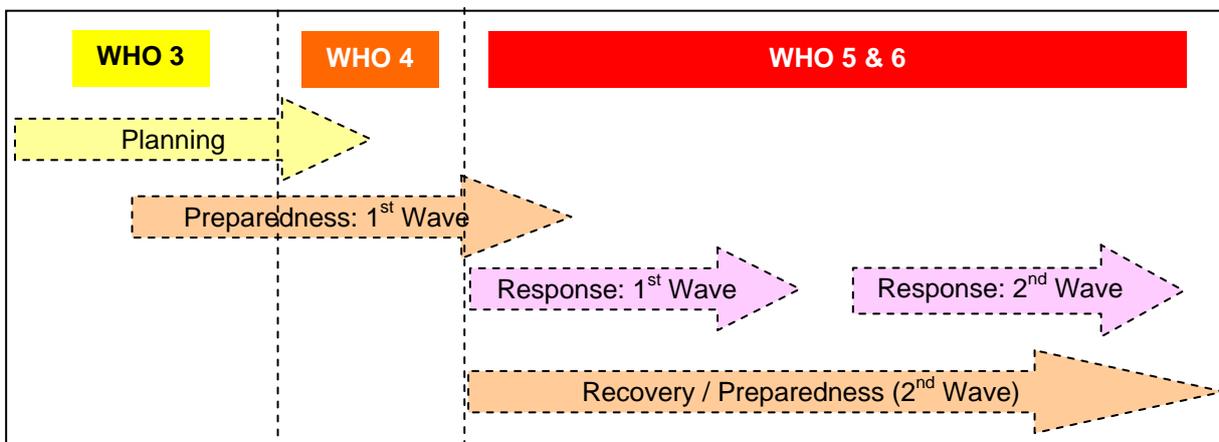
- Anticipate the potential impact of a pandemic on costs and cash flow (of your organisation and others in the same financial supply chain).
- Do not assume that public money will be available in significant quantities during or after the pandemic to solve the financial problem; the whole economy is likely to be under enormous pressure.
- Devise and implement short term savings programme and/or freeze any development monies ahead of the pandemic.
- Consider carefully the effect of stock-holding policies on cash flow and work with procurement and others to optimise these.
- Liaise closely with key financial stakeholders including funders, customers, suppliers and staff, working in partnership to minimise the impact on all concerned.

### 13. Recovery and Second Wave

There could be only a relatively short period of time between the subsidence of the first pandemic wave and a second wave. There is no certainty over a second wave nor any definite prediction of its potential timing or severity. One possibility is that the operational impact could be more severe in the second wave as the pandemic virus adapts further to its human host. A first wave of low attack rate or severity should not be taken as a predictor of a mild second wave. There is a greater likelihood of a vaccine being available in time for a second wave but this cannot be assumed with certainty if the second wave is soon after the first. It is highly likely that anti-viral stocks will be severely depleted by the first wave and unable to be restored in time for a second. It should not be assumed that a severe first wave would be followed by a mild or moderate second wave or vice versa.

The planning aim should be to be at least as prepared for a second wave as for the first and to achieve this state as quickly as possible as the first wave passes through.

At least for larger organisations, it is recommended that a separate recovery group is established very early in the pandemic response within the command and control arrangements. This will allow recovery to be prepared for most effectively and in as timely a manner as possible. Having a separate recovery team will enable concentration on both the peak response and the recovery process simultaneously and as effectively as possible. The recovery task group should report in to the same overall command and control arrangements described earlier in this plan and, if established early, will gather intelligence and begin detailed recovery planning whilst the other teams are still finalising response actions and managing the response.



It is likely that the recovery part of the response will be last to be “stood down” before the top team itself is stood down from the pandemic crisis. However, this will depend on intelligence about a potential second wave. If a second wave is assumed and potentially imminent (within

1-3 months) then the whole command and control is likely to be required to remain active for some time and at least until this position resolves..

Good communications between the main response team and the recovery team will be essential. As well as being represented in the overall top response team (GOLD), the recovery team should be advised of each key change enacted and the date / sequence of enactment of these. It may be considered helpful for the recovery team to be the primary owners and recorders of the response decision log and to keep this log in a format and sequence which will permit it to be used as a guide to withdraw decisions in the reverse sequence of their implementation.

The overall response objective for the recovery phase is the same as for the main response:

- To endeavour to maintain the provision of critical products and services at or above the level demanded by the healthcare community.

However, for recovery, to this are added two further objectives:

- To return to a near normal operational status as quickly as possible.
- To return to a state of readiness for a second wave.

#### Key considerations for the Recovery process include:

- Determining the recovery point objectives. These could depend significantly on information emerging about vaccines and vaccination. The default objective should be recovery to at least an immediately pre WHO 6 state of preparedness (modified by any recent learning from the adequacies or inadequacies of that status). If it is certain (or at least formally advised by the authorities) that there will be no second wave and/or that a vaccine will be both effective and available then recovery to a WHO 3 state of preparedness may be more appropriate.
- The unwinding of any response decisions, ideally in the reverse order of them having been implemented, as soon as it is safe to do so. Assuming the response was proportionate and concentrated on implementing the “lowest risk” decisions first and “higher risk” ones last, then reversing this order should ensure that a “least risk” system of operation is restored as quickly as possible. Any decisions which changed the status of the blood organisation with respect to regulations or guidelines should certainly be reversed at the very earliest possible moment and as the first recovery priority in order to restore a fully compliant, regulated blood supply.

- Responding to pressures to support the early restoration of capacity in the wider healthcare system and to address backlogs in that system. Subject to the restoration of fully compliant services, it will be important for the blood organisation not to be an unnecessary constraint on the wide healthcare system recovery process or any associated backlog reduction programme for elective procedures. Urgent priority should therefore be given to restoring blood stocks rapidly to near normal levels and to withdrawing blood shortage measures as quickly as possible. Depending on stock levels as the organisation emerges from the pandemic, this could require significant short term increases in capacity in donor marketing and recruitment, blood collection, processing, testing and possibly also blood issue. Some care may also need to be taken not to “overshoot” the recovery of blood stocks by adjusting the recovery approach to the actual stock and donor response rates.
- It will be important not to cause the immediate recurrence of blood shortages by lifting any restrictions too early, but it should be possible to ease restrictions based on strong upward stock trends and before blood stocks are fully recovered. In recovery, the priority will be to make blood available for use as required in the healthcare system rather than holding onto limited stocks and reserves in the blood organisation until stock levels are fully restored. Close liaison with hospitals and information about their stocks will also be key factors here.
- If donors have been invited to attend more frequently (e.g. within 10 or 12 weeks of their previous donation) the team must consider carefully how to convert back to normal donation intervals and remain within the guidelines for the overall maximum number of units donated whilst not adding to problems with supply.
- Ensuring that any plans for mass vaccination of the public do not prevent blood collection activities which are necessary to restore the blood supply.
- Managing access to pandemic vaccine for blood service staff as appropriate.
- Communications of recovery changes and progress with recovery to key stakeholders especially the Regulator, hospital users of blood products and services, donors and key suppliers.
- Restoring blood stocks, consumable stocks (including flu consumable stocks) and workforce capacity to recovery point levels. This could also include some elements of “cleaning up”. For example, if a decision had been made to allow production of plasma from female donors where normally this is not practised for TRALI risk reduction purposes, it may be a recovery goal to restore plasma stocks to being 100% male derived as quickly as possible including arranging for the possible discard of female plasma from stock as male plasma stocks re-build.

- Applying any early learning from the first wave to preparations for the second wave.
- Adjusting second wave preparations based on any new or emerging intelligence about the potential probability or impact of a second wave.

## 14. Return to Normality

Recovery (above) is the core process by which the blood organisation will return as close to normality as possible in as short a time as possible. Normality will be almost achieved when recovery point objectives have all been met. Restoration to normality as quickly as possible will be important but the time required for this to be fully achieved should not be underestimated.

### Key considerations for the Return to Normality process include:

- Normality after a very severe pandemic could be significantly different from normality before the pandemic. The organisation will need to take this new context into account in its strategic planning and priority setting after the pandemic.
- A very severe and/or prolonged pandemic could have significant long term adverse impacts on people who are most affected. These effects could be both physical and psychological. This will need to be taken into account in dealings with staff, donors and others in the months following the pandemic.
- Pandemics are recurring events.
- Because future pandemics or other events with severe or prolonged impact on donor and/or staff availability may require the adoption of similar measures to those applied in this pandemic, a return to normality should include a formal process of reviewing lessons learned and applying these to pandemic plans before those plans are stored away for future use.

## **15. Training and Exercising**

For an organisation to be able to respond effectively to an emergency using plans that it has created, all key personnel need to be trained against the contents of those plan(s) and familiarised with their role(s) in relation to it. Training needs to be comprehensive and specific and, where possible, post training assessments made to demonstrate understanding.

Before an emergency, the effectiveness of plans can only be assessed through the use of simulations or scenario-based training and exercising. Where possible relevant training and exercising should take place in collaboration with other organisations who would have a role in relation to the plan.

Both training and exercises provide opportunities to challenge the plans and identify opportunities to improve both the plans themselves and any associated preparedness actions.

Emergency plans should be regularly reviewed and improved.

## Appendix 1 – Major Planning References and Resources

### WORLD HEALTH ORGANISATION

1. WHO: 10 Things You Need to Know about Pandemic Influenza  
<http://www.who.int/csr/disease/influenza/pandemic10things/en/>
2. World Health Organisation (WHO) global influenza preparedness plan 2005  
[http://www.who.int/csr/resources/publications/influenza/WHO\\_CDS\\_CSR\\_GIP\\_2005\\_5.pdf](http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_GIP_2005_5.pdf)
3. WHO Epidemic and Pandemic Alert and Response (EPR) - Avian influenza  
[http://www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/)
4. WHO Current Phase and link to Pandemic Preparedness  
[http://www.who.int/csr/disease/avian\\_influenza/phase/en/](http://www.who.int/csr/disease/avian_influenza/phase/en/)
5. WHO Maintaining a Safe and Adequate Blood Supply in the Event of Pandemic Influenza  
[http://www.who.int/csr/disease/avian\\_influenza/guidelines/bloodsupply/en/index.html](http://www.who.int/csr/disease/avian_influenza/guidelines/bloodsupply/en/index.html)
6. Donor Selection Guidelines in Pandemic Situations (Blood Regulators Network)  
<http://www.who.int/bloodproducts/brn/DonorSelectionincaseofPandemicSituations.pdf>
7. National Pandemic Influenza Plans submitted to WHO  
<http://www.who.int/csr/disease/influenza/nationalpandemic/en/index.html>

### EUROPE

1. European Union - Pandemic Influenza Preparedness at EU Level  
[http://ec.europa.eu/health/ph\\_threats/com/Influenza/influhome/influenza\\_level\\_en.htm](http://ec.europa.eu/health/ph_threats/com/Influenza/influhome/influenza_level_en.htm)
2. European Centre for Disease Control – Pandemic Preparedness  
[http://ecdc.europa.eu/en/Health\\_topics/Pandemic\\_Influenza/](http://ecdc.europa.eu/en/Health_topics/Pandemic_Influenza/)
3. European Overview of National and International Influenza Plans  
[http://ecdc.europa.eu/en/Health\\_Topics/Pandemic\\_Influenza/Pandemic\\_Planning.aspx](http://ecdc.europa.eu/en/Health_Topics/Pandemic_Influenza/Pandemic_Planning.aspx)
4. European Influenza Surveillance Scheme – Pandemic Plans on the Internet  
[http://www.eiss.org/html/pandemic\\_plans.html](http://www.eiss.org/html/pandemic_plans.html)

### UK (Integrated Blood Shortage Plans)

1. Emergency planning: Development of an integrated plan for the management of blood shortages  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4085662](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4085662)
2. An integrated plan for the National Blood Service and hospitals to address platelet shortages  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4139156](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4139156)

### Exercise

If blood organisations wish to exercise their plans, NHS Blood and Transplant in the UK has created an “off the shelf” DVD based pandemic influenza exercise called “Exercise Cold Blood”. Please contact NHS Blood and Transplant for more information.

## Appendix 2 - Pandemic Planning Framework

*Reproduced courtesy of the International Blood Emergency Planning Action Group (IBEPAG) and Alliance of Blood Operators (ABO)*

Pandemic influenza planning is a very long, detailed process similar to disaster planning yet different in certain critical aspects. In a pandemic, the physical facilities are intact but staffing, essential services, training, and infection control processes are at the forefront. One cannot simply write a pandemic plan and be done. There is no one-size-fits-all template that can be used. Planning is a process that must be undertaken with this in mind.

Planners setting out to develop a pandemic plan are faced with what can initially be seen as an overwhelming task. While checklists are useful once the planning process is underway or almost complete, the first step to constructing a plan is to build the framework within which the pandemic plan will be created. The framework is the foundation upon which planners will logically and methodically make the decisions required to create and execute an effective plan. Not only will it make the project less overwhelming, it will help prioritize tasks, guide decisions, and assist in development of an efficient and effective plan. Key steps required for a pandemic planning framework are suggested below. These steps provide the direction required to pull together the myriad activities required to build a cohesive pandemic plan.

STEP	ACTION	EXAMPLE*
1	Secure top management support and adequate resources for development of the plan	<ul style="list-style-type: none"> <li>▪ Chief Executive Officer</li> <li>▪ Divisional Vice Presidents</li> </ul>
2	Identify what will be achieved by creating the plan	"To provide a safe and adequate supply of blood and blood products to citizens during a pandemic and to uphold the reputation of the blood organisation."
3	Review WHO and your national and local public health plans to understand as far as possible the planning context within which the blood organization will find itself operating during a pandemic.	<ul style="list-style-type: none"> <li>▪ WHO, national and local plans</li> <li>▪ Departments of Health</li> </ul>
4	Seek to promote active participation and recognition of blood supply at local and national levels including advising of possibility of blood shortages.	<ul style="list-style-type: none"> <li>• Seek invitation to join national/local pandemic planning teams if possible.</li> </ul>
5	Establish assumptions upon which the plan will be developed. Consult broadly with stakeholders to test assumptions.	<ul style="list-style-type: none"> <li>• Up to 3 waves, 5-8 weeks peak illness per wave, perhaps 3 months between waves</li> <li>• Or, 1 "worst case" wave of 15 weeks in total</li> <li>• 35% of blood donors and staff will get sick</li> <li>• Sick people will be off work for 1-3 weeks</li> <li>• Possibly a "stay at home if you can" culture leading to further loss of blood donation</li> <li>• 10% donor and staff absenteeism to care for ill family members</li> <li>• No vaccine for first wave, availability for second wave unknown</li> <li>• Mass public gatherings likely to be curtailed</li> </ul>
6	Develop Guiding Principles that will provide structure, guide decision making, and will be strictly adhered to throughout development of the plan. <u>This is a very important step</u> as there is a great deal of ambiguity involved in developing a pandemic plan and there will be times when the team will be unsure of the correct path or decision points. Guiding Principles	<p>"The Organization will</p> <ol style="list-style-type: none"> <li>1. Ensure critical services are provided</li> <li>2. Aim to reduce risk of illness for our employees, volunteers, and donors</li> <li>3. In a pandemic ensure dealing with its impact is management's top priority</li> <li>4. Pace our response to ensure we can sustain activity for the duration of the pandemic</li> </ol>

STEP	ACTION	EXAMPLE*
	established at the beginning and adhered to throughout will help ensure consistency.	5. Provide transparent communication to stakeholders and uphold the reputation of the organisation 6. Conform, where possible, to normal requirements and standards and to minimize disruption of processes."
7	Establish the primary planning components that will comprise the plan.	<ul style="list-style-type: none"> <li>- Preparedness</li> <li>- Information</li> <li>- Operational Capacity</li> <li>- People</li> <li>- Communication and Reputation Management</li> </ul>
8	Develop contingency plans for the lines of operation.	<ul style="list-style-type: none"> <li>- Recruiting/Marketing</li> <li>- Donor Services</li> <li>- Collections</li> <li>- Production</li> <li>- Testing</li> <li>- Logistics</li> <li>- Human Resources etc</li> </ul>
9	Establish decision points for implementation of contingency plans.	<ul style="list-style-type: none"> <li>- Staff absenteeism</li> <li>- Public health declarations</li> <li>- Commercial transport availability</li> <li>- Collections targets missed</li> <li>- Donor attendance rate</li> <li>- Inventory levels</li> </ul>
10	Continue to consult with stakeholders about feasibility of contingency plans and to ensure integration of plans across organizations. Gain consensus to the extent possible and obtain approval of key decision makers. Focus on ensuring that the reputation of the organisation is upheld.	<ul style="list-style-type: none"> <li>- Senior management</li> <li>- Hospitals</li> <li>- Government agencies</li> <li>- Regulators</li> </ul>
11	Develop or identify the tools, processes, procedures, protocols, etc. required to support the contingency plans.	<ul style="list-style-type: none"> <li>- Key messages and communications tools</li> <li>- HR policies</li> <li>- Wellness Checkpoints</li> <li>- Emergency Operations Rooms</li> <li>- Personal Protective Equipment</li> <li>- Redeployment process</li> <li>- ETC</li> </ul>
12	Create aids, explanatory documents, training material, action plans or other supplements to the tools, processes, procedures, etc. that will facilitate understanding or implementation of the contingency plans.	<ul style="list-style-type: none"> <li>- Employee Guide</li> <li>- "How to Keep Yourself Healthy" information for staff and volunteers</li> </ul>
13	Train staff to the overall pandemic plan and specific departmental contingency plans	Train staff on: <ul style="list-style-type: none"> <li>- Pandemic plan components</li> <li>- Relevant departmental contingency plans</li> <li>- Wellness initiatives</li> </ul>
14	Develop exercise material and test the plan	<ul style="list-style-type: none"> <li>- UK "Cold Blood" table top exercise</li> </ul>
15	Review and improve the plan in light of exercising and new information	

## Appendix 3 - Pandemic Planning Checklist

Reproduced courtesy of the International Blood Emergency Planning Action Group (IBEPAG) and Alliance of Blood Operators (ABO)

This checklist is a compilation of tasks that should be considered when preparing a pandemic plan. It is by no means exhaustive and is provided to help the planner get started on the pandemic planning path. There are many good checklists developed by various organizations. Additional reference material may be found in the Toolkit Resources document.

Maintaining your reputation as an effective blood organisation before, during and after a pandemic will depend on effective planning and preparedness. This check list may help you to complete or review your planning.

<b>PLANNING</b>		
	<b>Think about this .....</b>	✓
1	Have you considered the importance of maintaining your reputation through the pandemic and are you planning an effective strategy to help achieve this?	
2	Have all areas of your business/workforce been included in the planning process?	
3	Have you addressed continuity plans for mission-critical functions?	
4	Do employees understand their roles and responsibilities in a pandemic response plan?	
5	Have you developed individual department plans?	
6	Have you addressed continuity plans for technology and systems?	
7	Have you considered the economic impact of a pandemic and addressed this in your budget?	
8	Has the plan been approved by corporate management?	
9	Do you have a strategy for keeping the plan current?	
10	Have you implemented an exercise/drill to test your plan and a schedule to repeat this periodically?	

<b>COLLABORATION</b>		
	<b>Think about this .....</b>	✓
1	Do you have access to up-to-date, reliable pandemic information from community public health, emergency management and other related sources?	
2	Is there a formal liaison with local and regional public health authorities?	
3	Have stakeholder organizations been consulted? E.g. hospitals, patient groups, funding bodies, regulatory bodies.	
4	Have you collaborated with governmental and local public health agencies and/or emergency responders to participate in their planning process, share your pandemic plans, and understand their capabilities and plans?	
5	Have you established formal linkages with these agencies to ensure their awareness of your issues and your timely access to information and, where appropriate, emergency supplies?	
6	Have you shared best practices with other businesses in your communities, chambers of commerce, and associations to improve community response efforts?	
7	Have you developed platforms (e.g. hotlines, dedicated websites) for communicating pandemic status and actions to vendors, suppliers and customers outside the worksite in a consistent and timely way, including redundancies in the emergency contact system?	

<b>COMMAND &amp; CONTROL</b>		
	<b>Think about this .....</b>	✓
1	Have you created a pandemic response team? Do the team members have clearly defined roles?	
2	Are copies of the plan accessible to those who need it?	
3	Who is in your chain of command?	
4	Are there clearly defined lines of authority in your plan?	
5	Have you set up authorities, decision points and procedures for activating and terminating the organization's response plan?	
6	Who in your chain of command can declare a pandemic response?	
7	Does your plan identify a specific team member responsible for documenting an event log regarding the effects of the pandemic?	
8	Have you identified the information that will be critical to understanding operational status and capacity of the organization to maintain operations? E.g. Blood supply and demand data, staff absenteeism	
9	Have you established the mechanisms for capturing and delivering critical operational information?	
10	Does your plan include Emergency Operations Rooms for your business continuity teams (including back-ups)?	

<b>OPERATIONS</b>		
	<b>Think about this .....</b>	✓
1	Have you developed models and planned for scenarios likely to result in an increase or decrease in demand for your products and/or services during a pandemic?	
2	Using this information, have you anticipated strategies to reinforce collections of critical products?	
3	Have you established a process to ensure adequate numbers of blood donors?	
4	Have you established a process to "recruit the recovered" among eligible blood donors?	
5	Have you identified critical employees and critical inputs required to maintain business operations by location and function during a pandemic? (e.g. raw materials, suppliers, major vendors, subcontractor services, products and logistics)	
6	Have you trained and prepared an ancillary workforce (e.g. contractors, employees in other job titles, retirees)? Current regulatory imperatives need to be considered.	
7	Have you consulted union representatives about your plan?	
8	Have you developed plans to target issuing blood components to those hospital patients who would need them most?	
9	Have you developed product delivery plans for your hospital customers?	
10	Have you determined the potential impact of a pandemic on business-related domestic and international travel (e.g. quarantines, border closures)?	
11	Does your plan include a component allowing for reduction of the frequency and type of face-to-face contact among employees and between employees and customers?	
12	Do you have sufficient medical supplies for key staff, e.g., vaccines, masks, antivirals, gloves?	
13	Do you have proper sanitizing equipment?	
14	Have you provided sufficient and accessible infection control supplies (e.g. hand sanitizers in common areas, tissues and receptacles for their disposal)?	
15	Have you established infection control policies for the prevention of spread of influenza at the worksite?	
16	Is there sufficient availability of medical consultants?	
17	Does your plan identify a specific team member responsible for monitoring and reporting the effects of the pandemic on the organization?	

## HUMAN RESOURCES

	Think about this .....	✓
1	Have you forecasted and allowed for employee absences during a pandemic due to factors such as personal illness, family member illness, community containment measures and quarantines, school and/or business closures, and public transportation closures?	
2	Have you incorporated plans for the rapid recruitment of additional workers?	
3	Have you established policies for employees who are exposed to pandemic influenza, are suspected to be ill, or become ill at the worksite (e.g. infection control response, immediate mandatory sick leave)? Is there a plan in place to evaluate employees before they report to the worksite?	
4	Does your plan consider employee compensation and sick leave absences unique to a pandemic and establish policies on when a previously ill person is no longer infectious and can return to work?	
5	Have you established policies for flexible worksite (e.g. telecommuting) and flexible work hours (e.g. staggered shifts)?	
6	Have you enhanced communications and information technology infrastructures as needed to support employee telecommuting and remote customer access?	
7	Have you evaluated employee access to and availability of mental health and social services during a pandemic, including corporate, community and faith-based resources, and improve services as needed?	
8	Have you established a plan for contacting family members and/or employees away from the organization (at home, on vacation, etc.)?	
9	Have you encouraged staff to develop their own family care plans for dependents and seniors?	
10	Do you provide information for the at-home care of ill employees and family members?	
11	Do you encourage and track annual influenza vaccination for employees?	

## COMMUNICATIONS

	Think about this .....	✓
1	Have you considered the importance of reputation management and the role of effective communications in assisting to uphold your reputation?	
2	Have you disseminated information to employees about your pandemic preparedness and response plan?	
3	Have you established an emergency communications plan with provisions to revise it periodically? This plan includes identification of key contacts (with backups) modes of communication, communication hierarchy (including suppliers and customers) and process for tracking and communicating business and employee status.	
4	Have you developed platforms (e.g. hotlines, dedicated websites) for communicating pandemic status and actions to employees and customers inside the worksite in a consistent and timely way?	
5	Have you established alternative modes to usual telecommunications, in the case of severe disruption of that infrastructure?	
6	Have you developed and disseminated materials covering pandemic fundamentals (e.g., signs and symptoms of influenza, modes of transmission), personal and family protection and response strategies (e.g. hand hygiene, coughing/sneezing etiquette, contingency plans)?	
7	Have you ensured that communications are culturally and linguistically appropriate?	
8	Have you anticipated employee fear and anxiety, rumours and misinformation and planned communications accordingly?	
9	Have you developed a communications plan to inform donors of your plans?	

## Appendix 4 – Potential Practice Changes – Tabulation and Assessment Matrix

This appendix contains a possible format for making assessing, deciding and recording changes to policy, practice or operational arrangements and a few worked examples to demonstrate how such the table could be used. The examples should be considered to be non-specific to any particular blood organisation.

To assist the decision making process the table could be sorted by the following fields

- Possible timing (earliest first)
- “Legal” (Yes then No)

This schedule can be prepared in advance of the pandemic and used to aid discussions internally and with the Regulator. (Provisional) decisions could be indicated by the use of brackets. Completing a comprehensive assessment using a format along these lines would demonstrate:

- a) A systematic approach to planning changes
- b) Careful consideration of each potential decision or change

**Pandemic Influenza: Identification and Assessment of Potential Changes (Partial example only)**

<b>Major area of Operational Activity</b>	<b>Blood Collection</b>
<b>Key objectives in a pandemic situation</b>	<p>1. To reduce the impact of influenza on attendance rates by creating an appropriate environment in which donors will continue to donate.</p> <p>2. To maximise the opportunities for, and eligibility of, the public to donate successfully.</p>

No	Practice or Procedure	Normal Practice	In a moderate/severe Pandemic Consider these decisions	Potential Benefit(s)	Potential Risk(s)	IT Change ?	Poss. Timing	Change "Legal"? Y/N	Current Decision (Y/N)
1	Distance between donors and staff on sessions.	No specific controls	Not less than 1 m between individuals except at venepuncture.	Reduced infection transmission, maintain donor confidence in NBS environment	Restricts suitable venues and limits throughput of donors.	N	WHO6	Y	(Y)
2	Donation interval WB (Males)	Normally 16 weeks	12. 10 or 8 week donation interval provided meet Hb criteria. (Refer to practice in other countries).	Increasing potential donor availability.	Small risk to donor. May reduce donors available after the pandemic.	?	WHO5	Y	(Y)
3	Use of (surgical) face masks - donors	None	(a) All donors to be provided with face mask on arrival and required to wear. (b) Donors to be offer optional face mask on arrival. (c) No donors to be provided with face masks. In all above donor to dispose of face mask as leaving session.	Unclear if there is a scientifically justified requirement in a "well person" health environment. Possible reduction in cross infection between asymptomatic persons. If public expectation is face mask wearing then may encourage donors to attend.	Use of face masks in session may put people off attending to donate. (Depends on public expectations). Disposal of face masks. Need to train in correct donning, removal and disposal of face masks.	N	WHO6 (Peak)	Y	(?)
4	Invitation letters, scripts and web-site messages.	Normal blood donation information provided with invitation / scripts etc.	Ensure strong messages in all communications with public / donors that they must not attend to donate unless fully fit and well.	Reduction of cross infection risk. Encourages well donors to attend by strongly discouraging unwell donors from attending.	None. (May also reduce numbers of fit and well donors attending).	?	WHO5 on	Y	(Y)

## Appendix 5 - Pandemic Influenza Communications Framework

The following table is a summary communications framework plan for some of the later pandemic phases. It was the result of an EBA EPAG workshop exercise and is not therefore complete. It should not be considered to be accurate for any particular organisation. It may assist blood services prepare their own communication plans.

Phase	Public / Donors	Blood Service Staff	Hospitals
<b>WHO 5</b> <i>NO CASES</i> <b>PREPAREDNESS</b> <b>Key Messages</b>	<ul style="list-style-type: none"> <li>A flu pandemic has not yet spread to this country. But if it does it could spread very quickly and is likely to have severe impact on the availability of blood here.</li> <li>Explain why donating blood will continue to be safe for donors and recipients.</li> <li>We have developed, and tested plans to try to limit, as far as possible, the severe effect a flu pandemic will have on the life saving products and services provided by our organisation.</li> <li>We will keep you informed about how you can help us to maintain a supply of blood.</li> <li>(Publish pandemic plan)</li> </ul>	<ul style="list-style-type: none"> <li>Refresh staff and the potential impact of a pandemic on the organisation and on aims and objectives of pandemic plan.</li> <li>Check that staff are clear about what they would need to do during a pandemic. Presentation of mechanisms to be implemented to help protect staff.</li> <li>Address staff concerns.</li> <li>Confirm how communications will work during a pandemic.</li> <li>Keep intranet updated.</li> <li>Develop a dedicated telephone line that staff can dial into during a pandemic to obtain the latest update.</li> </ul>	<ul style="list-style-type: none"> <li>A flu pandemic has not spread to this country. But if it does it could spread very quickly and is likely to have severe impact on the availability of blood here.</li> <li>Explain why donated blood will continue to be safe.</li> <li>We have developed, and tested plans to try to limit, as far as possible, the severe effect a flu pandemic will have on the life saving products and services provided by our organisation.</li> <li>We will keep you informed on how you can help us to maintain a supply of blood.</li> </ul>
<b>WHO 6</b> <i>EARLY NATIONAL CASES</i> <b>EARLY RESPONSE</b> <b>Key Messages</b>	<ul style="list-style-type: none"> <li>A flu pandemic is likely to be in this country soon. It will have a severe impact on the availability of blood here.</li> <li>We have developed, and tested plans to try to limit, as far as possible, the severe effect a flu pandemic will have on the life saving products and services provided by our organisation.</li> <li>Describe changes planned at collection sessions and reasoning for changes.</li> <li>Explain why donating blood is safe</li> </ul>	<ul style="list-style-type: none"> <li>A flu pandemic is likely to be in this country soon. It will have a severe impact on the availability of blood here.</li> <li>We will need staff who are well to continue to work so that patients get the life saving products they need. This may mean changing how, when and where we work. More details will become available over the coming days and weeks.</li> <li>Outline of our plans, aims and challenges; reassuring staff; importance of staff working; general</li> </ul>	<ul style="list-style-type: none"> <li>A flu pandemic is likely to be in this country soon. It will have a severe impact on the availability of blood here.</li> <li>Explain why donated blood continues to be safe.</li> <li>We have developed, and tested plans to try to limit, as far as possible, the severe effect a flu pandemic will have on the life saving products and services provided by our organisation.</li> <li>We have (?) developed blood shortage management plans. At this time it is prudent to remind hospitals</li> </ul>

Phase	Public / Donors	Blood Service Staff	Hospitals
	<p>for donors and recipients.</p> <ul style="list-style-type: none"> <li>• Currently blood stocks are satisfactory, but we would strongly encourage blood donors who are well to keep their appointments to give blood.</li> <li>• Consider also: May need to introduce early “please stay away if you are unwell or recent household contact” message.</li> </ul>	<p>advice about flu</p>	<p>of these plans and advise you that you can find a copy of these plans at ..... Please be ready to play your part in the use of these plans should that become necessary. Key focal points of these plans are:.....</p>
<p><b>WHO 6</b> NATIONAL PEAK PEAK RESPONSE <b>Key Messages</b></p>	<ul style="list-style-type: none"> <li>• Frequent publication of blood stock information</li> <li>• Describe changes in place at collection sessions and reasoning for changes.</li> <li>• Explain why donating blood is safe for donors and recipients.</li> <li>• If you feel unwell or you have been in contact with someone in your household who has the flu in the past [X] days then PLEASE DO NOT attend a blood donor session.</li> <li>• Blood stocks are low and we urgently need people who are well to give blood now, especially those who have had and recovered from the flu (more than X* days ago) and who now feel fit and well</li> <li>• Blood donor sessions are a safe place to be (needs careful wording).</li> </ul> <p>*Where X is the current deferral period.</p>	<ul style="list-style-type: none"> <li>• Frequent publication of blood stock information</li> <li>• The flu pandemic is having a severe impact on the availability of blood in this country.</li> <li>• We need every staff member who is well to continue to work so that patients get the lifesaving products they need.</li> <li>• If you think you have flu, stay at home and follow the guidance given by the Department of Health and NHS.</li> <li>• Return to work as soon as you are fit and well.</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent publication of blood stock information.</li> <li>• Blood stocks are/are not holding up satisfactorily. Our forecast for stocks over the coming days/weeks is as follows:.....</li> <li>• Identify any particular shortage areas etc.</li> <li>• We have/have not(?) needed to deploy our blood shortage management plans. Please do x, y and z to assist us to conserve supplies.</li> <li>• Explain why donated blood continues to be safe.</li> </ul>
<p><b>WHO 6</b> FEW CASES</p>	<ul style="list-style-type: none"> <li>• Extra thanks to donors for their strong support through the pandemic.</li> </ul>	<ul style="list-style-type: none"> <li>• Thanks to you and your families for all of your hard work and support during the worst phases of the pandemic.</li> </ul>	<ul style="list-style-type: none"> <li>• We are working with the health department, the media and our staff to highlight the urgent need for people to</li> </ul>

Phase	Public / Donors	Blood Service Staff	Hospitals
<p><b>END OF 1<sup>st</sup> WAVE</b> <b>Key Messages</b></p>	<ul style="list-style-type: none"> <li>Blood stocks are low and we urgently need people to give blood now to help us rebuild blood stocks especially in case of a second wave.</li> </ul>	<ul style="list-style-type: none"> <li>Blood stocks are low and we must still work very hard over the coming days to rebuild blood stocks and get our organisation back to functioning normally again.</li> <li>It is possible that there will be a further pandemic wave in the next few weeks or months. Our aim therefore is to recover quickly and be as prepared for that as possible.</li> <li>(Provide any known information about pandemic vaccines and helping staff to access it).</li> </ul>	<p>come forward and give blood in the coming days to help us to rebuild blood stock.</p> <ul style="list-style-type: none"> <li>Our blood shortage plans will remain in force for the time being until stocks are restored to at least basic levels.</li> <li>Our aim is to help you to restore to normal your services to patients which depend on blood as quickly as possible.</li> </ul>
<p><b>Key Message Delivery Mechanisms</b></p>	<p>The media will be one of the main channels available to communicate with the public. We will employ:</p> <ul style="list-style-type: none"> <li>Press releases</li> <li>Interviews / media visits</li> <li>Frequently asked questions</li> <li>Fact sheets</li> <li>Media position statements</li> </ul> <p>Information will be delivered to the donors/public by,</p> <ul style="list-style-type: none"> <li>Donor magazine / associations</li> <li>An information leaflet</li> <li>Specific website pages</li> <li>Contact centre scripts</li> <li>Donor facing staff</li> <li>Invitation letters</li> <li>Text messages</li> <li>Links from other web pages (e.g. health department)</li> </ul>	<p>Internal communications delivered by:</p> <ul style="list-style-type: none"> <li>Via our detailed plans</li> <li>Team/staff briefings (minimise face to face contact around peak)</li> <li>Provide regular updates as appropriate via intranet, email and line management routes</li> <li>Dedicated phone information line for staff</li> </ul>	<p>We will communicate with hospitals by</p> <ul style="list-style-type: none"> <li>Meetings with hospitals (but not during the pandemic peak).</li> <li>Fax</li> <li>Email</li> <li>Telephone</li> <li>Pandemic newsletter</li> <li>Website information pages</li> </ul>

## Appendix 6 – Sequencing and Reporting

### A.6.1 Sequencing

Although having information that is as up to date as possible at the top level of the Command and Control arrangements is very important, this must be balanced against ensuring that time is allowed to ensure that the quality of that information is adequate. It should be acknowledged at the higher levels of command that some information being received will be out of date to a degree. The quality and timeliness of information will vary depending on the systems in place to generate that information. For example, in blood organisations, blood stock and blood collection information reporting and consolidation is normally a well established daily routine and information on same day stocks and previous day collections is typically available by 10:00 or sooner on Day 0. By contrast, other information, such as attendance of staff at work may not normally be available at all. An indication is given below of the possible upward reporting cycles including an idea of the age of the oldest information being reported and therefore being used to inform strategic decisions. The timings are indicative only and need to be adjusted depending on any reporting requirements established by external bodies.

	<b>AT BRONZE (ASSESSMENT)</b>	<b>BRONZE to SILVER</b>	<b>SILVER to GOLD</b>	<b>GOLD Upwards</b>
<b>Daily cycle</b>	Am Day -1	Noon Day -1	Pm Day -1	Noon Day 0
<b>Oldest information</b>	0 days	0.5 days	1.0 days	1.5 days
<b>Weekly cycle</b>	Day – 3	Am Day -2	Am Day -1	Noon Day 0
<b>Oldest information</b>	0 days	1 day	2 days	2.5 days

It is important to note that the focus of the operational response is likely to be at local or departmental level (i.e. BRONZE) with the strategic response being set by GOLD, moderated by any external influencers and implemented by SILVER. It is at BRONZE where immediate hour by hour decisions will be being taken to maintain the supply chains within the context of policy and practice changes being enabled by GOLD through SILVER in response to significant adverse trends.

Decision-taking and implementation of decisions will also need careful sequencing with sufficient time being allowed to implement decisions effectively. Implementation lead time will vary considerably depending on the nature of the decision to be implemented. For example, any decision that requires attending donors to be notified in advance will take longer to deploy than decisions to alter internal operational practice changes. Changes which require IT changes could be on a particularly long lead time and, if considered likely, need to be prepared and tested early as part of preparedness.

## **A.6.2 Reporting**

### **a. Planning Reporting (WHO 3)**

Planning and preparing for a pandemic is a major task and it is important to assess progress with planning. One way of achieving this might be through the use of check lists or self audit tools. These could provide a reasonable estimate and highly visible evidence for the governing Board of the state of readiness of the organisation to be able to respond to an emerging pandemic against reasonable expectations of the level of preparedness required at WHO 3. Because of the potentially very long duration of WHO 3, regular re-assessment of planning should be carried out perhaps annually.

### **b. Preparedness Reporting (WHO 3, 4 and 5)**

As blood organisations complete their initial planning processes, they need to begin to shift to preparedness reporting. This type of reporting differs from planning progress reporting (above) and response and situation reporting (below) in that it is establishing, ahead of the crisis, the actual state of readiness of the organisation to weather that crisis and to deploy the response actions that it is planning. Wherever possible, such reporting should be quantitative and verifiable. For example, if the planning process requires that consumable stocks should be increased or flu specific consumables should be obtained and stock-piled (e.g. face masks) then preparedness reporting would be used to assess progress towards ensuring these stocks are actually in place at the point in time planned. For some items such as these, early preparedness reporting will be appropriate at WHO 3 but this type of reporting becomes particularly important at WHO 4. It should remain in place until such time as the pandemic is close at hand (i.e. WHO 6) when response and situation reporting takes over (below).

Preparedness reporting may best be formatted against each of the main response areas set out in the plan with these being hardened up into measurable objectives and targets, such as defining and achieving the actual levels of consumable stocks required.

### **c. Response and Situation Reporting (WHO 5 and 6)**

Situation reporting describes the operational status of the organisation at any given moment in the crisis. It needs to draw together regularly and frequently the actual operational position in a useable and concise format. The blood organisation may well be required to report daily on its operational status and key decision-making to key stakeholders. This reporting requirement could commence at WHO 5, but is more likely to be formally implemented at WHO 6. In order to provide up to date information with the minimum of effort, the organisation will need to develop a system of consolidating information received in a concise and informative manner.

Key information to be summarised on regular pandemic situation report(s) is likely to include:

- Demand for key products and services
- Capacity to meet demand
  - Staff attendance levels
  - Stocks of finished goods (e.g. red cells by blood group)
  - Donation rates
  - Stocks of raw materials and critical consumables
  - Operational issues (e.g. failed plant or equipment)
- Key measures implemented to date
- Key measures currently under consideration
- Key measures withdrawn (particularly as recovery commences)
- Current key messages to:
  - Donors/public
  - Hospitals
  - Staff
  - Suppliers

## Appendix 7 – Example Key Stakeholder Analysis (not exhaustive)

The table below may be useful in assisting blood organisations to identify their key stakeholders.

Customers	Suppliers	Authorities	Management	External
Donors (Donor families) <ul style="list-style-type: none"> <li>• Blood/cells</li> <li>• Others</li> </ul>	Staff (Staff families)	Health Department <ul style="list-style-type: none"> <li>• Blood Policy</li> <li>• Pandemic Flu Section</li> </ul>	Board	Other Blood Services <ul style="list-style-type: none"> <li>• National</li> <li>• International</li> </ul>
Patients (via treating clinicians)	Contractors	Competent Authorities <ul style="list-style-type: none"> <li>• Regulators</li> </ul>	Clinical leadership and executive management team	Media / public <ul style="list-style-type: none"> <li>• National</li> <li>• Local</li> </ul>
Hospital users <ul style="list-style-type: none"> <li>• Transfusion</li> <li>• Transplantation</li> <li>• Surgery</li> </ul>	Critical suppliers <ul style="list-style-type: none"> <li>• Blood packs / harnesses</li> <li>• Testing</li> <li>• Others</li> </ul>	Other health authorities	Other management teams or expert groups	Central Government <ul style="list-style-type: none"> <li>• Policy</li> <li>• Communications</li> </ul>
(Patient organisations)	Other suppliers	Local authorities		European Blood Alliance
(Clinician organisations)		Public health agencies		Alliance of Blood Operators
(Donor organisations)		Health & Safety regulator		

## Appendix 8 – Supplier Risk Assessment Questionnaire

This appendix contains a questionnaire layout which could be used to seek information on emergency and pandemic preparedness from key suppliers.

### SUPPLIER RISK ASSESSMENT QUESTIONNAIRE

Supplier Name : \_\_\_\_\_ Blood Operator Name \_\_\_\_\_

Products Supplied \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

1. How many sites are capable of manufacturing the subject product ? \_\_\_\_\_  
 1     2     3     4     5 or more

2. Are these sites located in \_\_\_\_\_ (name of country)? \_\_\_\_\_  
 Yes     No     Partially

3. Can lot release for the finished product be performed in more than 1 site ? \_\_\_\_\_  
 Yes     No

4. Does your company have a documented contingency plan for each site ? \_\_\_\_\_  
 Yes     No     Partially

5. Does the contingency plan cover current third party warehousing ? \_\_\_\_\_  
 Yes     No     Partially     Not Applicable

6. Are these warehouses located in \_\_\_\_\_ (name of country) ? \_\_\_\_\_  
 Yes     No     Partially

7. Does the contingency plan include plans for pandemic influenza outbreak ? \_\_\_\_\_  
 Yes     No

8. Does the contingency plan cover possible disruptions in transportation of these goods from your site(s) to \_\_\_\_\_ ? \_\_\_\_\_  
 Yes     No

9. How frequently do you test your contingency plan ? \_\_\_\_\_  
 Yearly     Every 2 years     Over 2 years

Please complete the following set of questions for each key product your company supplies.

10. How much finished inventory for general use do you carry ? \_\_\_\_\_

11. How much finished inventory specifically for \_\_\_\_\_ do you carry ? \_\_\_\_\_

12. What percentage of your general inventory besides the regular \_\_\_\_\_ allocation would you be willing to commit to \_\_\_\_\_ needs in case of a Pandemic ? \_\_\_\_\_ %

13. What is the production lead time for the product ? \_\_\_\_\_ (W.Days)

14. What is the lead time to switch the production to a different site ? \_\_\_\_\_ (W.Days)

15. What is the generic production lot size for the product ? \_\_\_\_\_

Reproduced courtesy of International Blood Emergency Planning Action Group (IBEPAG) and Alliance of Blood Operators (ABO)

## Appendix 9 – Blood Shortage Plans Checklist

### Developing Contingency Plans for Managing Blood Shortages

#### A Check List

#### **Terms and Conditions of Use**

*Property of, and copyrighted to NHS Blood and Transplant (NHSBT) and the Alliance of Blood Operators (ABO). Any use of these materials must acknowledge sources and ownership (as above). They are shared to assist planners.*

*These materials are part of an emergency planning tool kit developed by the International Blood Emergency Planning Action Group (IBEPAG). They are for informational purposes only and should not be considered a substitute for specific planning by your individual organisation using all available and relevant resources.*

*NHSBT, IBEPAG and ABO do not undertake to provide updates nor warrant the fitness of this document for use by any specific organisation. NHSBT, IBEPAG, ABO and their members disclaim any legal liability arising from the use of these materials by any person or organisation.*

#### **Acknowledgement**

This document was originally provided to IBEPAG for further development courtesy of NHS Blood and Transplant, UK. The originating authors are named at the end of the document.

## Developing Contingency Plans for Managing Blood Shortages

No.	Action Point	✓
1	Start planning now! Don't underestimate how long it will take. The UK Red Cell shortage contingency plan was in development for three years.	
2	Ensure you have the support of your Health Authority and your Blood Service Board for the principle of developing a shortage plan. If possible, get the plan agreed and issued by the Health Authority to ensure it is seen as a joint health plan rather than purely a Blood Service plan.	
3	Shortage planning requires an integrated approach with full clinical engagement especially for any aspect of planning relating to possible triage of patients for access to limited supplies of blood components. Identify the key experts and stakeholders early and ensure they are involved. You may require several stakeholder groups to cover different aspects, e.g. clinical and logistical. A number of smaller groups are easier to manage and help to ensure people are involved and providing relevant input.	
4	Ensure you have identified all of your customers and included them in the plan and consultation especially if crossing borders. Do not overlook smaller, remote customers.	
5	It is important to ensure an integrated approach with other component suppliers (e.g. for plasma)	
6	Need to fully understand the healthcare environment in which blood is used to optimise which restrictions in usage will work.	
7	An understanding of what blood components are used for and where blood usage could / should be reduced at different severity levels of shortage is essential but data is generally poor. In UK 65% is medical, Haematology /oncology use is dictated by transplant and intensive Chemotherapy regimes; cell salvage is now commonplace. All affect the priority and scope for reducing usage in times of shortage.	
8	Use the best data available but recognise that it will not be possible to derive a precise plan from data. A framework to which Blood Services and Hospitals can operate in times of shortage is the main aim of blood shortage contingency planning.	
9	Consider how to structure your plan so that its status and use is simple to follow, actions to be taken are as straightforward as possible and can be easily and clearly communicated. For example, the UK Plan uses a "red", "amber" and "green" traffic light system to communicate shortage status with each of these levels linked to actions on the part of the hospitals and the Blood Service. (Note that the UK plan is continuously in operation at "green" even when there is not actual shortage. and to follow.	
10	Ensure that your plan mentions the commitment by the Blood Service to improve supplies. However, do not treat this topic in detail in the blood shortage plan because there is a risk that the purpose and importance of the shortage management plan will be diluted and the difficult measures necessary to deal with genuine shortages will not be adequately developed as a result.	

No.	Action Point	✓
11	Consider all alternatives for reducing or shifting use to make best use of limited supplies. For example: <ul style="list-style-type: none"> <li>◆ Wider use of cell salvage for red cells</li> <li>◆ Use of RhD positive blood for RhD negative men and women past child bearing age</li> <li>◆ Use of alternative blood groups.</li> <li>◆ Stock-piling frozen components in advance.</li> </ul>	
12	Ensure that the plan mentions the possibility of importation of blood components from other Blood Services if all efforts to improve supplies and shortage management insufficient to maintain life-saving supplies.	
13	Plan how you will communicate about the available supply, actions to take to try to reduce usage and the measures being taken by the Blood Service to improve the supply.	
14	Consider your legal position and include statements in contracts or service level agreements about following contingency plans in times of shortage.	
15	Ensure the legal/legislative framework will support your plans and explore whether they will allow some capability to modify product specifications if required.	
16	Ensure the approval and publication mechanisms for the plan are clear both within and external to the Blood Service.	
17	Distribute drafts widely for consultation to ensure all comments are taken into account.	
18	Implementation and embedding of the plan requires intensive communication, training and joint exercising with hospitals to help ensure the plans are understood in the wider hospital community and to test and improve them.	

### Authors and Contributors to this Checklist

#### Primary Authors:

Lucy Frith Lead HLM, Projects, NHS Blood and Transplant

Dr Heidi Doughty, Consultant Haematologist, NHS Blood and Transplant

#### Edited by:

Richard Bedford, working to Alliance of Blood Operators (IBEPAG)

#### Other Contributors:

Terry Selva, National Risk Management, Australian Red Cross Blood Service

Steven Smith, Director of Operations Support, Canadian Blood Services

## Appendix 10 - PANDEMIC INFLUENZA PLAN OUTLINE HEADINGS

### Version 2.1 – 2 December 2007

The following list of headings was developed by the EBA EPAG working group in December 2007 to help inform participating members' planning processes. This consolidated document has drawn from and built upon these headings during its development. Organisations may find these headings will also provide them with a helpful framework on which to base their plans.

1. Background ("Stakeholders", e.g. government, regulator, suppliers, will read our plan)
  - a. Overview of our Blood Organisation (*who are we? what do we do? our structure? our customers, sources of materials, our products, volumes etc.*)
  - b. Relationships and influencing stakeholders  
(*Our blood organisation's place within wider national structures and services*)
  - c. Pandemic Influenza – Describing the Threat to our Blood Supply  
(*Impact on donors and staff and why, in general terms, the pandemic influenza impact will not balance out in terms of demand and supply for blood – more detail in 4*)
2. Overall Aims and Objectives of this Plan  
(*E.g. to, at least, maintain a supply of life saving components and related services to patients*)
3. Guiding Principles  
(*A list of the key guiding principles or values which will underpin the plan*)
4. Planning Assumptions – Reasonable Worst Case Scenario (*Includes impact modelling?*)
  - a. The anticipated impact of severe Influenza on Society
  - b. Effect of severe Influenza on the Blood Organisation and Supply
  - c. Regulatory and Legislative Framework
5. The Structure of our Plan(s)
  - a. Stages of our Planning and Response + Possible trigger points
    - i. WHO Alert Level 3 – Planning (and advance preparations)
    - ii. WHO Alert Level 4 – Preparedness
    - iii. WHO Alert Level 5 – Activation
    - iv. WHO Alert Level 6 – Response and Further Wave(s)
      1. "Head" of wave?
      2. "Body" (Peak) of wave?
      3. "Tail" of wave?
    - v. Recovery (between waves and after pandemic phase)
  - b. Possible Planning & Preparedness Components for each stage
    - i. Countermeasures (*what can we do to stop or lessen the impact at this stage?*)
    - ii. Key Information Required (*what do we need to know at this stage?*)
    - iii. Operational Capacity (*what materials, equipment, processes, change approvals?*)
    - iv. People Actions (*Flu is a people impact scenario. Donors (potential and actual), staff*)
    - v. Communication (*What are the key messages to the key stakeholders?*)
    - vi. Reputation Management
6. Plan Overview – For Each Major Area of Operational Activity
  - a. Organisation, Management and Command and Control
  - b. Reputation Management
  - c. Communications
    - i. Public and Donors
    - ii. Staff
    - iii. Hospitals
  - d. Infection Management
    - i. Donors
    - ii. Staff and Visitors
    - iii. Blood Transmission Risks
  - e. Critical Supplies and Key Suppliers

- f. Blood Donors and Blood Collection
- g. Blood Processing
- h. Blood Donation Testing
- i. Storage, Distribution and Provision of Blood to Hospitals
- j. Blood Shortage Management
- k. Tissue / Stem Cell Services
- l. Other Laboratory Services
- m. Research and Development
- n. Human Resources, Employee Welfare and Staffing of Services
- o. Infrastructure
  - i. Information Technology and Telecommunications
  - ii. Fuel, Power, Water and other Utilities
  - iii. Buildings and Building Services