

Maintaining a Safe and Adequate Blood Supply in the Event of Pandemic Influenza

Guidelines for National Blood Transfusion Services

19 May 2006



1 Rationale

Current global concern that an occurrence of pandemic influenza may be imminent is based on recent experiences with avian influenza H5N1. However, a pandemic could also be caused by another influenza virus with the same pandemic potential.

Transfusion support is an essential component of clinical medicine, with transfusion being life-saving in many acute situations and many chronically ill individuals receiving regular transfusion therapy. It is therefore critical that national blood transfusion services (BTSs) recognize the potential impact of pandemic influenza on their blood supply systems and put contingency plans in place to ensure the maintenance of core services in the event of such a pandemic.

2 Recommendations

The Blood Transfusion Safety programme, Department of Essential Health Technologies, World Health Organization, proposes the following precautionary principles to national blood transfusion services to ensure the safety and adequacy of national blood supplies in the event of pandemic influenza.

- 1 Ensure the inclusion of the blood transfusion service in the national influenza contingency planning body.
- 2 Establish a mechanism for the blood transfusion service to receive regular, up-to-date epidemiological information on the spread of influenza in the country.
- 3 Develop a blood transfusion service contingency plan, which is reviewed constantly, regarding:
 - Risk of transmission of influenza by blood transfusion
 - Temporary loss of blood donors resulting in a reduced supply of donated units of blood
 - Temporary loss of staff
 - Changes in the clinical demand for blood and blood products.
- 4 Work with national health authorities, hospitals and other responsible bodies to determine expected blood usage during any pandemic and to plan blood collection activities accordingly.
- 5 Provide advice and guidance to all staff to minimize the risk of exposure, including the provision of prophylaxis, as appropriate and in accordance with any specific requirements in the national contingency plan.

3 General considerations

To ensure an effective and appropriate response to any pandemic, each blood transfusion service must ensure that it has a specific organizational contingency plan in place for this, and other major incidents. It should also ensure that it is actively involved in national contingency planning for pandemic influenza. While national planning often focuses on the early detection, verification and containment of infection, the implications for other aspects of health care of the rapid spread of an acute and severe infectious disease must be considered; blood transfusion support is such an example.

In the case of blood transfusion activities, contingency planning must include both planning for continuity in the supply of blood and blood products, and an awareness of probable changes in the demand for blood and blood products. In addition, in situations where containment measures are likely, or already in place, the blood transfusion service needs to ensure that blood collection activities do not compromise containment.

Central to planning is the inclusion of the blood transfusion service in the national contingency planning body. This ensures that the blood transfusion service is informed as early as possible about any possible emerging infections and the subsequent intended actions. This information can then be used as part of the service's own contingency planning to consider issues related to blood donation, possible cancellation of donation sessions in areas where cases have been identified and any potential changes in local or national requirements for blood and blood products. The blood transfusion service can plan effective responses only if this information is available to it as early as possible. In addition, any planned changes in the allocation or provision of health care nationally in response to any pandemic situation need to involve the blood transfusion service so that it can plan its activities to match planned national needs.

A major factor in the ability of a blood transfusion service to maintain an adequate safe blood supply is its overall structure and organization in terms of the number of its blood donation sites or sessions, the number of blood collection teams and the number of blood donors or potential donors within the catchment area of each site or session. In countries with more isolated population groups, for example, it is possible to focus collection activities in certain areas where any pandemic infection would take longer to infiltrate, increasing overall activity at these sites, within reason, to cover potential losses at sites closer to or in the middle of areas in which pandemic infection is more likely or already present.

Additional safety measures for the health and safety of staff will need to be introduced.

4 Risk of transmission through blood transfusion

The risk of the direct transmission of influenza via blood or blood products is extremely low. There are no published reports of the transmission of influenza viruses by blood transfusion in humans or in animal models. The transmission of a respiratory virus by transfusion is unlikely to result in an infection in the recipient except in the most extreme cases where the viral load is particularly high.

Importantly, a major assumption in all current international influenza pandemic contingency planning has been that infection with the emerging virus leads to moderate to severe respiratory illness. The incubation period for human influenza viruses in general is short: i.e. 2 to 3 days (range 1 to 7 days). However, with influenza A (H5N1), the median time between exposure and the onset of illness is 3 days (range 2 to 4 days). The early symptoms of influenza are very similar to those of most other respiratory viruses and, as part of the national blood donor selection guidelines, anyone who is symptomatic is not permitted to donate blood. It is not possible definitively to rule out any theoretical risk of the transmission of influenza through blood transfusion. In practice, however, the risk of this occurring is very small. Importantly, the risk of transfusion transmission is significantly less than that of contracting influenza from direct exposure through the airborne route of transmission. Further research is required to assess the level of viraemia in asymptomatic patients and the consequent risk of transfusion transmission.

5 Temporary loss of blood donors and the impact on the blood supply

As infection spreads through any population, the number of blood donors available at any one time decreases. This is due to infection in the donors themselves; infections in the families and contacts of donors; restrictions on movements, including blood collection activities in areas where outbreaks have been recorded; and the unwillingness of some individuals to donate due to a perceived risk of infection through being in close contact with others.

Infection in blood donors

Infection in the general population results in a decrease in the number of blood donors available. At any one time, up to 25% of donors could be lost due to infection. To mitigate this, the blood transfusion service should inform donors about the importance of maintaining an adequate national blood supply throughout any pandemic, but should also educate and inform donors about influenza, routes of transmission and signs and symptoms of infection. Specifically, donors should be informed of the importance of:

- Not donating blood if the donor is feeling unwell
- Reporting immediately to the blood transfusion service any illness within a specified time following donation
- Resuming blood donation on resolution of infection, after an appropriate time following complete resolution of symptoms.

It is critical that blood collection activities continue, but on a targeted basis, identifying and attracting low risk donors with the aim of maintaining blood collections at the required level.

Infection in families or contacts of blood donors

Donor numbers may decrease due to infections among donors' families and contacts rather than donors themselves, often because of time requirements in caring for infected individuals. In such a situation, donors would be ineligible to donate as they would have been exposed to known infected individuals and might be at

an early stage of infection themselves. The losses of donors in this category may be higher than in those actually infected and cumulative losses of up to 50% may occur.

In addition, donors who have been vaccinated against influenza or have taken other prophylaxis may have to be deferred due to the prophylaxis administered. The duration of deferral should be determined within blood transfusion service contingency planning.

Restrictions in blood collection activities

As cases emerge, various strategies may be implemented in the attempt to prevent a pandemic ensuing. The current WHO Pandemic Influenza Draft Protocol for Rapid Response and Containment, updated draft 17 March 2006, outlines a containment strategy based on the rapid identification of potential or actual emerging disease and containment at source, using a number of approaches including vaccination, restriction of social interactions of infected individuals with non-infected individuals, and restrictions on movements into and out of areas where infections have been confirmed.

The containment strategy may impact directly on blood collection activities by limiting the ability of donors to attend donation sessions and, more importantly, by preventing mobile blood collection teams from visiting certain venues or areas. In addition, collection staff may either be exposed unnecessarily to infection or even contribute to the spread of infection. Thus, at certain times in certain areas, blood collection activities are likely to be limited significantly. Contingency planning for this is essential. Alternative strategies are needed to enable the rapid switching of collections from area to area, avoiding high risk areas and concentrating on educating and motivating donors and potential donors in low risk areas. Effective public awareness campaigns on the need for blood donation should run continuously throughout any pandemic.

Public and blood donor awareness

As with any major issue affecting the general population, ignorance or misinformation may deter individuals from donating blood through fear of exposure to an increased risk of infection. The blood transfusion service should address these issues by providing simple, clear information about the need for blood and the safety of the donation process. This information should be disseminated continuously throughout the pandemic, using all available media.

6 Loss of staff working in blood transfusion services

As infection spreads through any population, blood transfusion service staff will be at equal risk to the rest of the population of acquiring infection, in the absence of any specific preventive interventions. The loss of staff is highly likely to affect blood transfusion service activities such that, directly or indirectly, the blood and blood products available for release for clinical use will be limited. Depending on the organization and structure of the blood transfusion service, activities could be reorganized from site to site as the pandemic moves across the country and as staff become ill and then recover and return to work. The overall loss of staff at any one time is hard to predict but, in severe cases, staffing levels may fall by 50%, although a loss of around 30–35% is more likely.

7 Changes in the clinical demand for blood and blood products

A reduction in the clinical demand for blood and blood products during any pandemic phase may result from specific contingency planning involving the overall provision of health care. A reduced demand may also result from a reduction in healthcare provision due to a fall in staffing numbers resulting from influenza in healthcare professionals and should be anticipated. Planned or forecast changes in demand should be quantified and addressed in contingency plans, specifically to feed in to planned changes in collection activities.

National health authorities are responsible for contingency planning, in advance of any pandemic, for the reduced usage of blood and products resulting from planned reductions in healthcare activities. Planned reductions in blood usage by 20–50% can be achieved in situations where at least a certain amount of blood is used in routine, planned, but non-emergency situations which can be forecast with some degree of accuracy.

In situations where the blood supply is already limited and where most blood is used in acute/emergency situations (e.g. childbirth, severe infant anaemia due to malaria, trauma), planned reductions are not possible and no more than a 10% fall in demand can be anticipated. The demand may be reduced in situations where restrictions on the movement of individuals and social interaction are implemented, but this is likely to be minimal.

The demand for blood may decrease as infection spreads to healthcare staff. As they become ill and are unable to work, this will itself limit activities through the reduced ability of hospitals to function.

The guidelines in this document focus on the collection, processing and transfusion of blood and blood products. Nevertheless, the same basic principles can also be applied to the collection, processing and use of other banked products such as tissues and stem cells. However, the nature of a number of tissue products is such that the risk of transmission may be different from that of blood and blood products and specific individual risk assessments for the different tissue types and storage conditions must be undertaken.

These guidelines will be reviewed and updated as new information becomes available. They are compiled to provide a generic basis on which national health authorities may wish to develop guidelines applicable to their own particular circumstances.