ISBT Working Party on Transfusion Transmitted Infectious Diseases (WP-TTID)

Annual Report of the Cost Utility Analysis (CUA) Subgroup

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Since the last WP-TTID annual meeting at the ISBT meeting in Macau, at which the CUA subgroup presented an update on the scope of the major pilot project of this group, core members of the subgroup have met in person, and have had numerous conference calls. The larger CUA has not been convened for a meeting or held any formal conference calls. No expenses have been incurred other than those associated with attendance of members at the Macau and upcoming Cairo WP-TTID meetings, and separately those funded by the pilot grant. An update of the activities of the CUA subgroup is summarized below.

Work Scope of the CUA Group

The central goal of the CUA subgroup of the WP-TTID is to promote the relevance and use of health economic methods in international blood safety. A key component of this is online modeling via a user friendly interface (see www.bloodsafety.info and www.bloodsafety.isbt-web.org) so that health authorities or researchers in different countries can conduct analyses using a set of common underlying models and assumptions.

Pilot Project

In the pilot project the CUA subgroup will enhance the existing web-interface so that analyses may be conducted more easily and can be compared more transparently. In addition the underlying HIV, HCV, and HBV disease progression and cost models are to be updated to meet current methodological standards and also allow future modular extensions, such as inclusion of interventions to enhance blood availability.

The key components of the pilot project are:

(1) Model design:
   a. Design a new comprehensive model for HIV, HCV, and HBV based on the experience of the WP-TTID members;
   b. Develop more flexibility in the strategy choices and comparators;
   c. Addition of discard (wastage) rate and more flexible donation screening strategies;
   d. Adapt the model to fit into the modular development framework.

(2) To conduct and report on an expanded health economic assessment of blood safety screening in 7 countries (addition of 4 more broadly-representative countries: Brazil, South Africa, Uganda and USA to the existing three, Ghana, Thailand, and the Netherlands). Each analysis will use country-specific incidence and prevalence of disease in the donor population and blood screening and medical care costs. See the Appendix for a list of preferred country-specific data. It is recognized that not all of this information will be available for all countries and that some data, such as window

periods associated with individual interventions, are applicable to more than one country.

(3) In addition to conducting the analyses, a prototype web-based and ISBT-linked application will be made available as a service to international experts and decision makers to allow customized local cost effectiveness or cost utility analysis and risk assessment by individuals/organizations that wish to perform such evaluations.

2008 Activities

Telephone conference calls between the core members of the group were held in May, August, September, and December of 2008.

Specific achievements include:

- January – The CUA subgroup grant proposal was submitted through the ISBT Foundation mechanism. The proposal was reviewed by ISBT Foundation grant application reviewers.

- April – Notification of a successful review and recommendation to fund the proposed research was obtained from the ISBT Foundation.

- June - Core members of the CUA subgroup met in Macau to outline products and deliverables for the group. It was decided that the interface of the new application should be changed to a more user friendly and accessible format so that persons without formal training in health technology assessment will find the interface more intuitive. The new interface has been termed a "dashboard" because of the layout and the fact that all features are readily accessible from the main start page. In addition several technical modifications to the underlying software were identified, and required changes to the disease outcome models were outlined.

- June – Grant funds were transferred from the ISBT WP-TTID to Blood Systems Research Institute to support the CUA subgroup research project.

- July – Blood Systems Research Institute subcontracts to BaseCase and HECTA were finalized and countersigned. Invoice procedures were established to permit payment for research activities based on achieving specified hallmarks in the project.

- August – The CUA group worked with ISBT IT officials to reserve the domain www.bloodsafety.isbt-web.org for use. This will ensure that access to the dashboard will route through ISBT websites, making sure ISBT is receives appropriate recognition for supporting this research project.

- November – Core members of the CUA subgroup met in person in the Netherlands to discuss model specification issues and to resolve the scope of the content for the first version of the application. Decisions regarding the content and model assumptions were made. Sources for updated model data were identified, with some data still to be provided by CUA members following contact with appropriate in-country contacts for the 7 initial countries.

- November – An update on the status and progress of the project was presented at the WHO-led Global Collaboration for Blood Safety (GCBS) meeting in Geneva.

2009 Activities (to March)

Telephone conference calls of the core members of the group were held in January and February 2009.

Specific achievements include:

- February – A prototype of the new dashboard and software was released and is being tested within the group.

- Content changes to the choice of interventions in the model were made. It was decided that anti-HBc should be included as a strategy in the current model in order to provide symmetry between the number of interventions included in the model for HIV, HCV, and HBV. Each infection now includes 4 possible screening strategies and each of these strategies can be tailored based on country-specific screening performance and cost data.

Future Activities (2009+):

Two major goals are planned for the next biennium are:

1. Seek multi-year program funding. The challenge has been to identify the correct organization to approach for funding.

2. Develop a close collaboration with other members of GCBS such as ABO and PEPFAR. These organizations have both in-country knowledge and potentially can identify data sources to use for country-specific analyses.

The initial strategy that focuses on the disease marker testing study that we are piloting under the ISBT WP-TTID will demonstrate the relevance and analytical capability of the WP-TTID subgroup and the GCBS Task Group. *The goal is to expand analysis scenarios in order to address more fundamental questions on blood availability in the 79 countries with limited resources and insufficient blood supplies.*

Letters of intent will be submitted to potential funding organizations to gauge interest. Agencies that we plan to apply to include the Gates Foundation and the Institute for Health Metrics and Evaluation at the University of Washington, Seattle (www.healthmetricsandevaluation.org/).

Appendix 1. Preliminary country-specific data requirements, default values can be used when country-specific information is not available, example data is provided in the Value column.

Data Type	Parameter name	Value	Unit
The INCIDENCE window phase model is used instead of the PREVALENCE window phase model when incidence data is available.			
Leave these parameters on 'NA', 'Not Applicable' if you only have prevalence data.			
Transmission risk - incidence window phase model	**Regular donors**	**100**	**%**
Transmission risk - incidence window phase model	**First time donors**	**0**	**%**
Transmission risk - incidence window phase model	**Incidence regular donors HIV Ab+**	**5.5**	**1/1,000,000 DonorYears (DY)**
Transmission risk - incidence window phase model	**Prevalence first time donors HIV Ab+**	**0**	**1/1,000,000 Donations (Dn)**
Transmission risk - incidence window phase model	**Incidence regular donors HCV Ab+**	**2.6**	**1/1,000,000 DY**
Transmission risk - incidence window phase model	**Prevalence first time donors HCV Ab+**	**0**	**1/1,000,000 Dn**
Transmission risk - incidence window phase model	**Incidence regular donors HBsAg+**	**11**	**1/1,000,000 DY**
Transmission risk - incidence window phase model	**Prevalence first time donors HBsAg+**	**0**	**1/1,000,000 Dn**
Transmission risk - incidence window phase model	**Correction factor for HBsAg+ incidence**	**3**	
The PREVALENCE window phase model is used instead of the INCIDENCE window phase model when only prevalence data is available.			
Leave these parameters on 'NA', 'Not Applicable' if you have incidence data.			
Transmission risk - prevalence window phase model	**Prevalence donors HIV Ab+**	**0**	**%**
Transmission risk - prevalence window phase model	**Prevalence donors HCV Ab+**	**0.0019581**	**%**
Transmission risk - prevalence window phase model	**Prevalence donors HBsAg+**	**0**	**%**
This group of parameters contains the window phase periods in days for each of the assays and also the local costs of conducting each type of blood safety screen.			
Window phase period	**HIV Ab**	**20.3**	**Days**
Window phase period	**HIV Combo (Ab,p24)**	**15**	**Days**
Window phase period	**HIV MP-NAT, Ab**	**9**	**Days**
Window phase period	**HIV ID-NAT, Ab**	**5.6**	**Days**
Window phase period	**HCV Ab**	**58.3**	**Days**
Window phase period	**HCV Combo (Ab,Ag)**	**12.5**	**Days**
Window phase period	**HCV MP-NAT, Ab**	**7.4**	**Days**
Window phase period	**HCV ID-NAT, Ab**	**4.9**	**Days**
Window phase period	**HBsAg**	**38.3**	**Days**
Window phase period	**HBsAg (late stage)**	**24**	**Days**
Window phase period	**HBV MP-NAT, HBsAg**	**38.3**	**Days**
Window phase period	**HBV MP-NAT, HBsAg (late stage)**	**24**	**Days**

Window phase period	**HBV ID-NAT, HBsAg**	**24.6**	**Days**
Window phase period	**HBV ID-NAT, HBsAg (late stage)**	**15.4**	**Days**
Window phase period	**Occult HBV+ unit detected per ID-NAT+/HBsAg- unit**	**1**	**Unit**
Cost of screening - HIV	**HIV ID-NAT**	**20**	**$/Dn**
Cost of screening - HIV	**HIV MP-NAT**	**10**	**$/Dn**
Cost of screening - HIV	**HIV P24**	**0.8**	**$/Dn**
Cost of screening - HIV	**HIV Ab**	**0.8**	**$/Dn**
Cost of screening - HBV	**HBV ID-NAT**	**20**	**$/Dn**
Cost of screening - HBV	**HBV MP-NAT**	**10**	**$/Dn**
Cost of screening - HBV	**HBsAg**	**0.5**	**$/Dn**
Cost of screening - HCV	**HCV ID-NAT**	**20**	**$/Dn**
Cost of screening - HCV	**HCV MP-NAT**	**10**	**$/Dn**
Cost of screening - HCV	**HCV Ab**	**4**	**$/Dn**
Cost of screening - HIV	**HIV Combo (Ab,p24)**	**1.6**	**$/Dn**
Cost of screening - HCV	**HCV Combo (Ab,Ag)**	**5**	**$/Dn**
Cost of screening - HIV	**HIV MP-NAT, Ab**	**10.8**	**$/Dn**
Cost of screening - HCV	**HCV MP-NAT, Ab**	**14**	**$/Dn**
Cost of screening - HBV	**HBV MP-NAT, HBsAg**	**10.5**	**$/Dn**
Cost of screening - HIV	**HIV ID-NAT, Ab**	**20.8**	**$/Dn**
Cost of screening - HCV	**HCV ID-NAT, Ab**	**24**	**$/Dn**
Cost of screening - HBV	**HBV ID-NAT, HBsAg**	**20.5**	**$/Dn**
Cost of screening - Multiplex	**Multiplex ID-NAT**	**25.3**	**$/Dn**
Cost of screening - Multiplex	**Multiplex MP-NAT**	**15.3**	**$/Dn**

This group contains epidemiological parameters related to blood transfusion recipients. Representative data for the entire country is preferred.

Recipient - epidemiology	**Number of transfusions per donation**	**1.66**	**1/Dn**
Recipient - epidemiology	**Mean age**	**65**	**Yrs**
Recipient - epidemiology	**Hospital mortality**	**0**	**%**
Recipient - epidemiology	**First year mortality**	**20**	**%**
Recipient - HIV infection	**Basic reproduction ratio of HIV**	**0**	
Recipient - HIV infection	**Availability of ART to HIV infected recipients**	**100**	**%**
Recipient - HIV infection	**Recipients infected with HIV before transfusion**	**0.2**	**%**
Recipient - HIV infection	**Duration of WHO stages 1 and 2**	**5**	**year**
Recipient - HIV infection	**Extension of WHO stage 3 by ART**	**12**	**year**
Recipient - HIV infection	**Cost of basic care for HIV**	**35**	**$/year**
Recipient - HIV infection	**Cost of basic care for AIDS**	**35**	**$/year**

Recipient - HIV infection	**Cost of ART**	**380**	**$/year**
Recipient - HBV and HCV infections	**HBV susceptibility (calc. from antiHBs prevalence)**	**95**	**%**
Recipient - HBV and HCV infections	**Progression to chronic HBV infection**	**5**	**%**
Recipient - HBV and HCV infections	**Infectivity occult HBV transmissions**	**19**	**%**
Recipient - HBV and HCV infections	**Recipients infected with HCV before transfusion**	**0**	**%**
Recipient - HBV and HCV infections	**Spontaneous HCV remission**	**31**	**%**
Recipient - HBV and HCV infections	**Access to liver transplantation**	**100**	**%**
Recipient - HBV and HCV infections	**Cost of HCV related hepatoencephalopathy - 1st year**	**11861**	**$**
Recipient - HBV and HCV infections	**Cost of HCV related hepatoencephalopathy - following years**	**2748**	**$/year**
Recipient - HBV and HCV infections	**Cost of HCV related variceal bleeding - 1st year**	**18479**	**$**
Recipient - HBV and HCV infections	**Cost of HCV related variceal bleeding - following years**	**3616**	**$/year**
Recipient - HBV and HCV infections	**Cost of cirrhosis**	**794**	**$/year**
Recipient - HBV and HCV infections	**Cost of ascites**	**1792**	**$/year**
Recipient - HBV and HCV infections	**Cost of refractory ascites**	**18094**	**$/year**
Recipient - HBV and HCV infections	**Cost of Hepatocellular carcinoma**	**30000**	**$/year**
Recipient - HBV and HCV infections	**Cost of liver transplantation - 1st year**	**100000**	**$**
Recipient - HBV and HCV infections	**Cost of liver transplantation - following years**	**100**	**$/year**

This group contains parameters related to health economics

Health economics	**Discount rate costs**	**3**	**%**
Health economics	**Discount rate effects**	**3**	**%**
Health economics	**Gross national income**	**36620**	**$/person**