Ignorance is not bliss

Many years ago, as a young man, I had the opportunity to hear a speech that stuck with me to this day. The topic was a discussion of the differences between knowledge and faith with the thesis that both were necessary to fully experience and understand the world. As the speaker pointed out, ignorance is not bliss because it leads to poor decisions, poor actions, and terrible consequences that can have a negative impact on the quality and even the quantity of life for many.

In this edition of **TRANSFUSION,** Xu and colleagues[1] describe the use of metagenomics in pooled plasma, with identification of potential emerging infectious pathogens. The article represents an attempt by the authors to increase knowledge of the presence of potentially pathogenic organisms in the blood donor population in their region. Their study is significant not only because of the methods and approaches being employed, but also because of the challenge that conducting such a study represents and the importance that it has in addressing a concern that has existed within the blood transfusion community for decades.

More than 1400 species of human pathogens are reported in the literature, and of those, 58% are known to be zoonotic with 13% regarded as emerging or reemerging.[2] Sixty-eight pathogens are designated with transfusion transmission potential;[3] however, the task of developing screening tests for these pathogens will never be completed because the emergence rate of new or mutated pathogens is daunting. On average, 5.3 viruses have emerged per year from 1940 to 2004, of which 60% to 70% are human pathogens.[3] The mean cost of developing and commercializing a diagnostic in the United States is $50 million to $75 million and typically takes years before it is available on the market. In the past three decades, key emerging pathogens including human immunodeficiency virus (HIV), hepatitis C virus, hepatitis B virus, Middle East respiratory syndrome coronavirus, DENV, Babesia, and Ebola virus have compromised, put into question, or threatened blood safety. Since the first cases of HIV were reported in 1981, approximately 1.8 million people in the United States have been infected.[4] Between 1985 and 1992, more than 8000 people in the United States acquired HIV through blood transfusion.[5] While the risk of contracting HIV through the blood supply is now low, the risk that a new or newly mutated pathogen could compromise the blood supply remains.

In 2005, Fauci[6] published a map of emerging agents that were classified as being emerging and reemerging infectious diseases in the 1995 to 2005 time frame. A modified and updated version of that map is included as the cover art for this issue of the journal. The list included such agents as Dengue, Ebola, and even human monkey pox and Marburg virus, which have only recently grabbed headlines. What was also interesting in the original presentation, however, is what was absent from the extensive list that was reviewed. Absentees included such pathogens as Babesia and Zika, all of which not only emerged into human populations in the 2005 time frame and beyond, but also provided concerns and major challenges to blood transfusion services around the world, whether faced with providing safe blood in the presence of epidemic outbreaks or consistent reemergence into human blood donor populations of these agents. Not all agents listed in this 2005 review posed concerns to the blood supply, but the list was not intended to focus only on blood donors and instead addressed the general concern of emergence or reemergence of agents into human populations in general. Relevance of such findings to blood safety is thus done by extrapolation.

The article by Xu and coworkers is significant in that its focus is analysis done using donated blood products. Due to their focus on this population, they not only provide a bellwether and means of monitoring the emergence of agents into human populations in general, but also provide a means to assess the risk directly to the blood supply in the most relevant way possible. This approach is somewhat unique and important when considering the role that transfusion medicine specialists and blood banking activities play on a global basis relative to public health.

Information of this nature is often difficult to obtain. As a colleague of mine in the blood diagnostics business told me many years ago, there is an old adage common in the industry to "never test for something you cannot cure." Quite often studies of the nature conducted by Xu and colleagues are difficult or impossible to conduct not for technical limitations but rather for the political and social concerns that arise that might require action that involves costs and unwanted public and political scrutiny. This view represents the "glass slightly moist" picture of the world. One can also view such information obtained in these blood surveillance studies in a much different and positive light, that is,

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the glass half full or empty, depending on your personal preferences. Perhaps knowledge of what is present in blood donor pools eliminates the need to bother unnecessarily with agents that are not present in blood. Demonstrating that an agent can be transmitted by blood is only relevant when it is known to be present in the blood of donor populations in a region of interest.

In this regard, the findings by Xu and colleagues[1] are of interest and relevance for what was not found in the tested samples as much as what was uncovered by the analysis. As the authors astutely point out, the actions that they recommend are based on their findings of what is present and not on a theoretical concern over what might be present. This approach of working from a vantage point of knowledge has clear advantages in making any subsequent interventions more likely to be cost effective and relevant to public health. Focusing of efforts, attention and resources in times when resources are limited is not only prudent but necessary. The knowledge provided through regional studies similar to those described by Xu and coworkers[1] could create a new map for the blood banking community with the potential to direct industry wide resources to the most pertinent agents and remove precious energy and focus from those of little or no relevance. Such a focus might also allow us to become more proactive in addressing agents that are in blood products earlier, before they produce headline grabbing notice due to transfusion-associated transmissions that come as a surprise to both the transfusion community and the public at large.

An example of the utility of the knowledge generated in this study is that among all of the findings reported by Xu and colleagues,[1] one virus (human adenovirus Type 1), three parasites (*Plasmodium knowlesi, Plasmodium falciparum, Toxoplasma gondii*), and several bacteria (*Legionella pneumophila, Streptococcus pneumoniae, Coxiella burnetti, Bordetella pertussis,* and others) were observed which could be concerns relative to blood safety. The authors go on to indicate that from all of these findings, the observation of *C. burnetti*, which is associated with Q-fever, is of most concern and thus warrants additional investigation and analysis to determine appropriate intervention on the larger scale. Such focusing of efforts could provide a means of preparation in advance of crisis and thus avert or reduce the likely impact of transfusion transmission that arises unexpectedly, such as recent cases that the authors cite that occurred in the Netherlands with Q-fever. This example provides a clear opportunity where action based on the knowledge and information that a study of this nature provides can be taken ahead of crisis; this path would appear to be preferable to waiting for reaction based on supposition or speculation arising from our lack of knowing in the midst of crisis. It also provides a means to justify investment where it makes the most difference and which can, by being made ahead of crises, avert the much larger expenses that are encountered after such crises have occurred.

Ignorance can only be bliss if we fool ourselves into thinking that not knowing means that the risks do not exist or that they will be problems easily handled when they do become knowns. Often in these settings, knowledge comes too late to protect patients and preserve the public trust and confidence in our industry. History should at least teach us this lesson if nothing else.

CONFLICT OF INTEREST

The author has disclosed no conflicts of interest.

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