

Building a More Sustainable U.S. Blood System

Medical advances have reduced demand for blood in the United States, while the number of blood centers collecting, processing, and distributing blood to hospitals has remained stable. The resulting competition has driven down prices that hospitals pay for blood; at the same time, production costs are increasing. As a result, the American Red Cross and a range of small and large blood centers are under financial duress and struggling to adjust to the new normal. RAND researchers assessed the primary characteristics of and pressures on the U.S. blood system to discover insights and recommendations for how policymakers can ensure the safety and sustainability of the blood supply.

Changing Landscape Puts Stress on the U.S. Blood System

Several factors are straining the system, especially for blood centers and suppliers of related equipment, goods, and services.

Changes in clinical practice—such as less invasive surgeries, patient blood management programs, and new drugs and guidelines that reduce the need for transfusions—have lowered demand for blood in the past decade. While demand for blood has fallen, the number of blood centers collecting, processing, and distributing blood has largely remained the same, and the resulting competition among blood centers has led to falling prices, which slice into blood centers' already thin margins and revenue.

Hospital consolidation has shifted negotiating power toward hospital buyers and away from blood centers. Large hospital chains are moving toward buying blood from larger blood centers that can meet their needs and accept lower prices.

New technologies, such as tests for specific diseases and broader pathogen-reduction technologies, and **emerging diseases**, such as the Zika virus, add production and testing costs that are difficult for blood centers to pass on to hospitals.

The system has mostly functioned effectively through these challenges to date, but the concern is that continued stress on blood centers could lead them to reduce their investments in research, innovation, and surge capacity; cause shortages, especially during emergencies; jeopardize the safety of blood products; and threaten the blood system's sustainability.

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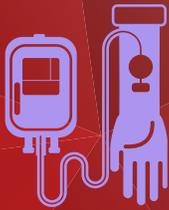


BY THE NUMBERS

U.S. Blood System in 2013



14.2 million
units of blood collected



15.2 million
donors



13.2 million
units of blood transfused



10–15%
of inpatient stays involve
the use of blood

Broad Alternatives for the Future Blood System

The path toward a more sustainable blood system may involve changes in the structure of the blood industry, to the financial arrangements between different stakeholders, and to the role of the government in the blood system.

Alternative 1

Let the U.S. blood system continue to function as it has

One alternative is to let the U.S. blood system continue to function as it has without new policy intervention. This approach may continue to result in a safe, sustainable blood system, but there may also be unintended consequences. Given current market conditions, the researchers expect that blood centers will consolidate over time without government intervention, improving the balance between supply and demand for blood in terms of volume and negotiating power. However, there are potential risks to allowing the market to adjust on its own, particularly if suppliers of blood consolidate quickly or unpredictably in response to market pressures. Although allowing the market to adjust naturally may yield a market equilibrium that is more stable in the long term, such adjustments may have negative effects in the short term: for example, shortages and loss of surge capacity.

Alternative 2

Let the government play a more active role

Another broad alternative is for the government to play a more active role in supporting the natural market adjustment by collecting more data for analysis and monitoring, adjusting how private and public health insurers pay for blood and health care services involving blood, and paying directly for new technologies or surge capacity where there is a clear public good involved. Expanding the government's role may help to minimize the disruptions and risks from the natural contraction of the market, but also carries potential risks, such as introducing market distortions that could raise the cost of delivering blood.

Alternative 3

Let the government assume complete responsibility

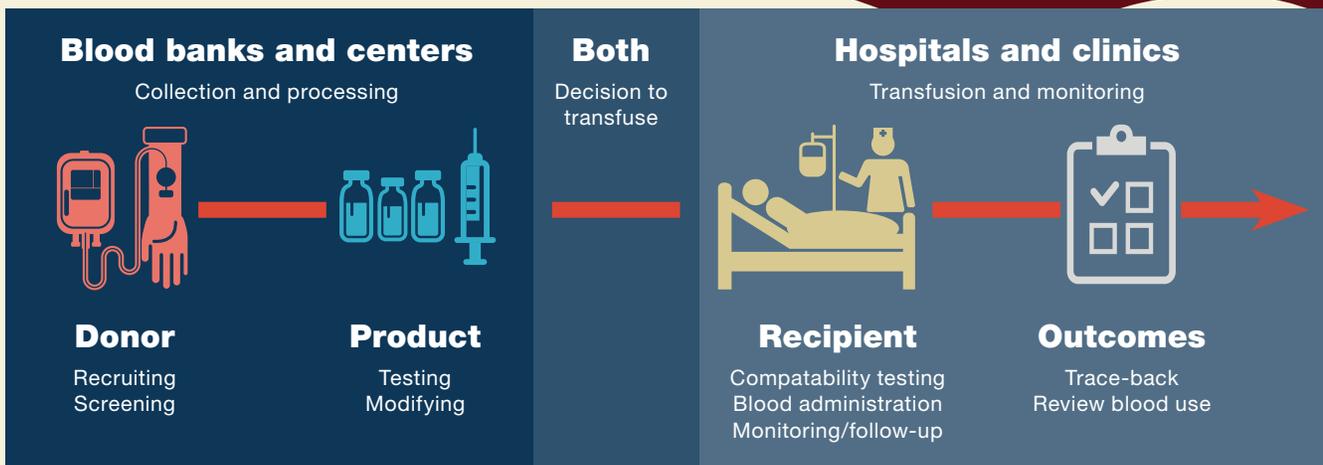
A third broad alternative is for the government to assume complete responsibility for the supply of blood, mirroring the government-operated blood systems in other countries, such as the United Kingdom. This approach would be a major departure from the status quo and could remove or weaken the system's current incentives to reduce costs. On the other hand, this approach would let policymakers manage routine supply and surge capacity to align with the needs of the health care system and public health. The researchers did not see justification for transitioning to an entirely public blood system in the United States. This transition would be disruptive—perhaps more so than the first alternative, where blood centers and hospitals continue under the status quo.



Weighing the Options

The researchers suggested that alternative 2—the middle-ground alternative in which the blood system remains privatized but with some additional government intervention—balances benefits from opportunities to improve sustainability against the risks and frictional costs from wholesale changes to the system. Under this approach, the government's role would be to facilitate the evolution of the current blood system into a more sustainable future system. Some aspects of the current system—for example price competition between blood centers—are working very well. Rather than completely replacing functioning aspects of this industry and accompanying incentive structures, the study proposed a set of recommendations that the U.S. Department of Health and Human Services (HHS) could consider to improve blood system sustainability. The recommendations below are all directed toward incremental government intervention supporting a continued private market for blood.

The U.S. Blood System from Vein to Vein



There are many stakeholders in the broader blood system beyond blood centers, hospitals, and health care payers. Volunteer donors supply almost all blood and its components, which are tested, processed, stocked, and distributed by not-for-profit blood centers, such as the American Red Cross. Blood centers deliver blood to hospitals, and most blood centers are only paid if and when the blood is used. Hospitals use the blood when they provide health care services, such as surgeries, to patients, and then Medicare and other insurers reimburse hospitals—rather than blood centers. The U.S. Food and Drug Administration (FDA) regulates collection, processing, and testing; the Centers for Disease Control and Prevention in conjunction with the U.S. Biovigilance Network monitor the blood system; and the National Institutes of Health supports and conducts research to improve collection, transfusion, and management of blood resources.

Key Findings

- Medical advances have dramatically reduced demand for blood, putting financial stress on blood centers.
- Although the current U.S. blood system operates efficiently most of the time, there are seasonal shortages and risks of more widespread shortages in the future if the market continues to contract.
- Changes in payment policies, improved capacity to handle emergency or surge needs, and investments in new technology would help ensure a safe, sustainable blood supply.



The Current System Operates Efficiently But Struggles with Spikes in Demand

In *Toward a Sustainable Blood Supply in the United States: An Analysis of the Current System and Alternatives for the Future*, the researchers define a sustainable blood system as one that maintains or improves on current safety levels for blood and blood products; provides blood for the full range of clinical applications consistent with standard practice; and delivers blood in a timely fashion. A sustainable blood system should maintain incentives for private innovation, operate efficiently in terms of production and delivery, minimize disruptions from routine market changes, and have sufficient surge capacity to cope with emergencies and other significant disruptions. Highlights of the findings included the following.

Pressures are mounting

Leading trends affecting the blood sector include reduced demand for blood, shrinking profits for blood centers and their suppliers, a shrinking pool of active donors, hospital consolidation, and blood center alliances and consolidation.

Alternative payment methods could mitigate pressures

Alternative payment policies—such as separate payments to hospitals for blood, direct payments to blood centers, subsidies to blood centers, or supplements for adopting new technologies—could mitigate short-term pressures on the blood system, but it is important to consider the status quo's advantages in terms of incentives for price competition.

Alternative market mechanisms could mitigate risk

Alternative market mechanisms—such as government incentives for maintaining surge capacity or the government providing this capacity itself—could mitigate the risk of individual hospitals or the blood system not having enough units in an emergency.

Maintaining appropriate levels of surge capacity

Natural disasters, terrorist attacks, and pandemics are the biggest emergency risks, and each varies in its potential effects on the blood system. Defining and maintaining appropriate levels of surge capacity will help to address these various risks, which may grow if the market continues to contract.

Different trends affect each business model differently

Business models that are shaping the landscape of blood provision include more nationally integrated organizations, local independent organizations, and blood brokerages. Various trends affect each model differently, and the expansion of each model carries different implications for the blood system.

Defining and maintaining appropriate levels of surge capacity will help to address these various risks

Best practices include effective blood monitoring, data analysis, and regulation

Best practices observed in selected foreign countries include effective blood monitoring programs based on reliable, comprehensive data analysis and wide dissemination of the results, a favorable regulatory environment for medical devices, and more government support for and coordination of research and development.

Recommendations

Tracking and Paying for Blood

Collect data on blood use and financial arrangements. The government does not have access to comprehensive data on the performance of the blood system as a whole, including when or how much blood is used, how much blood is stocked by hospitals, and what prices hospitals pay for blood. This makes it difficult to monitor whether the market is functioning well and to develop policies to improve the sustainability of the blood system as needed.

Safety and Innovation

Build a value framework for new technology and determine which technologies to encourage and pay for. In some cases, hospitals and blood centers do not adopt new technologies (such as pathogen-specific tests) because the benefits do not justify the cost from a business perspective. But these technologies are important to the public if they improve safety or sustainability. HHS should assess existing technologies with low adoption rates and technologies on the horizon, determine which technologies significantly benefit society, and then enact policies to encourage their adoption or pay for them directly.

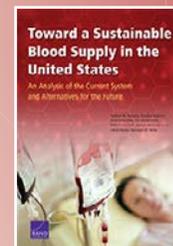
Surge Capacity

Develop and disseminate a vision for appropriate levels of surge capacity. Clearly setting out the desired level of surge capacity from a public health and preparedness perspective will help stakeholders distinguish between the costs of maintaining surge capacity and the normal costs of doing business.

Subsidize blood centers' ability to maintain surge capacity. Maintaining a surge capacity falls outside the normal costs of doing business. Today, blood centers have some capacity to meet emergency needs, but once they adjust to lower demand, this capacity may not continue. If blood centers are asked to retain excess staff, collection capabilities, or stock that exceeds demand from hospitals, there is a strong argument that the government should finance this surge capacity rather than assume that it will be paid for through the usual business arrangements.

Build relationships with brokers and other entities to form a blood safety net. HHS should partner with the American Red Cross, the Armed Services Blood Program, and blood brokerages to help address short-term and local shortages.

Implement emergency use authorization and contingency planning. If a blood supplier goes under, it could take months for another supplier to fill the gap. Through the FDA, HHS could implement emergency use authorizations for replacement supplies and other inputs in the event of a shortage, as it did to expedite blood supplies to Puerto Rico during the Zika crisis. More broadly, the FDA and HHS should engage in a dialogue with suppliers on regulatory approval requirements and expectations.



This brief describes work done in RAND Health documented in *Toward a Sustainable Blood Supply in the United States: An Analysis of the Current System and Alternatives for the Future*, by Andrew W. Mulcahy, Kandice Kapinos, Brian Briscoe, Lori Uscher-Pines, Ritika Chaturvedi, Spencer Reynolds Case, Jakub Hlavka, and Benjamin M. Miller, RR-1575-DHHS, 2016 (available at www.rand.org/t/RR1575). To view this brief online, visit www.rand.org/t/RB9939. The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

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"By the Numbers" on page 7 from K.-W. Chung, S. V. Basavaraju, Y. Mu, K. L. van Santen, K. A. Haass, R. Henry, J. Berger, and M. J. Kuehnert, "Declining Blood Collection and Utilization in the United States," *Transfusion*, Vol. 56, No. 9, May 12, 2016, pp. 2184–2192; C. Allison Russo and Anne Elixhauser, "Hospitalizations in the Elderly Population, 2003," Statistical Brief No. 6, Agency for Healthcare Research and Quality, May 2006.] NOTE: Number of donors exceeds number of collections because many donors are deferred for safety reasons.

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