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HEALTH SCIENCES AND THE DEVELOPMENT OF TRANSFUSION MEDICINE–THE IMPACT OF FOREIGN AID CUTS

Cees Th. Smit Sibinga[1]

[1]IQM Consulting for International Development of Quality Management in Transfusion Medicine, and University of Groningen, NL

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ABSTRACT

The global blood supply is skewed to developed countries, where around 16% of the global population lives. Over 40% of all blood collections occur in Very High or High Human Development Index (VH/H-HDI) countries. The Low- and Medium-HDI (L/M-HDI) countries house around 84% of the global population. Blood donation rates in many Low- and Medium- Human Development Index (L/M-HDI) countries represents <1% of the national population. Yet, demand for blood in L/M-HDI countries is relatively high mainly due to maternal hemorrhage; other causes of anemia, e.g., malaria in under 5-years old children; HIV/AIDS; trauma and traffic accidents, armed conflicts, civil wars and insurgence. Guided through WHO, many projects from developed countries have been launched or are still being implemented. Due to the recent financial fund humanitarian foreign aid cuts these have slowed down or stopped with their implementation which leads to a change in priorities and creates prolongation of existing challenges particularly in the health care and availability of safe blood. The gap between the developed (around 16% of the global population) and the developing countries (over 80% of the global population) will therefor rapidly increase.

Key Words: Human Development Index, Foreign Aid Cuts, Health Care, Blood Supply.

Introduction

The global blood supply is heavily skewed to developed countries, where around 16% of the global population lives. Over 40% of all blood collections occur in Very High or High Human Development Index (VH/H-HDI) countries.[1] The Low- and Medium-HDI (L/M-HDI) countries house around 84% of the global population. Blood donation rates in many Low- and Medium- Human Development Index (L/M-HDI) countries represents <1% of the national population.[2] Yet demand for blood in L/M-HDI countries is relatively high largely due to maternal hemorrhage; other causes of anemia, e.g., malaria in under 5-years old children; HIV/AIDS; trauma and traffic accidents, armed conflict, civil war and insurgence.[2,3] This is particularly true in countries where National Blood Transfusion Services (NBTS) face a range of barriers and challenges to collect, maintain and deliver a safe and adequately balanced blood supply,[4,5] such as in table 1.

Transfusion Medicine should be an integrated part of the health care and sciences to achieve an adequate balance between need and demand, and the supply. In most of the Low-and Middle-Income Countries Health Care System and science, including Transfusion Medicine is in its development supported by foreign aid, financing long term projects focused on strengthening these systems and structures. A political cut in foreign aid and reduction in supportive experts to guide and advice might have a serious effect on the necessary development programs, blood safety and availability.

Table 1 - Barriers and challenges to collect, maintain and deliver a safe and adequate blood supply.[4, 5]

1. Weak, outdated, unenforced policies and/or regulations ranging from national-level Blood Policies to standardized work instructions used at the facility-level. No process descriptions. Low political awareness about the role of blood collections, blood laboratory and clinical transfusion services within the broader healthcare system where blood transfusion is often overlooked or under-funded as a component of comprehensive primary healthcare services and not an integrated part of the health care and academic structure.
2. Management capacity with poorly described communication channels, delegation of authority/responsibility, and chains of command.
3. Human resources with major problems due to lacking or imprecise (e.g., "nurse" vs. "blood collection nurse" or "phlebotomist") job descriptions; gaps in pre- and in-service education and training opportunities; no continuous education programs (continuous medical education or CME, continuous professional development or CPD); poorly defined or unavailable career structures within the NBTS (National Blood Transfusion Service). Additionally an absence of applied research and development.
4. Quality management where a quality system, quality assurance are lacking. Standards and programs are not in place or not enforced, documented Quality System Management is rudimentary and quality culture is non-existing.
5. Blood donor culture and population epidemiology shows a low community awareness about voluntary blood donation, blood transfusion and the risks associated with both; lack of outreach and education programs to mobilize and retain an adequate pool of willing blood donors with low behavioural risk profiles (e.g., voluntary, non-remunerated, regular donors) and high community prevalence of transfusion transmissible infections (TTI), e.g., HIV, HBV, HCV, syphilis.
6. Infrastructure with inconsistent and/or inefficient procurement and supply logistics, especially cold-chain, reagents; lack of quality-assured and standardized laboratory screening for TTI markers; inadequate

cross-matching laboratories, and weak/non-existent infection control and safe waste management systems.
7. Inappropriate use of blood due to low prescribing thresholds (inexperience, patient demand, tradition, lack of alternatives); wastage and/or unnecessary pressure on supplies due to irrational and traditional prescribing practices, and absence of proper traceability.
8. Hemovigilance non-existing due to incomplete documentation, traceability, and monitoring and evaluation (M&E) systems.
9. Little interest and funding for applied research, look-back or benchmark studies due to inappropriate data management and a non-developed science-oriented culture.
10. Ethics show inconsistent use of informed consent for donors and transfusion recipients, regular coercion, poor privacy protection and counseling.
11. Financing illustrates few functional cost-recovery models (e.g., South Africa), with NBTS budget often embedded in laboratory or clinical services, or outsourced to an NGO (e.g., Red Cross/Red Crescent) and inadequate funding due to demands elsewhere in the healthcare system (e.g., national HIV/AIDS, malaria and tuberculosis response, vaccination programs) and lack of awareness about continued need.
12. Sustainability at risk due to dominance of international donors (e.g., PEPFAR, EU, WB, ADB, USAID) with time-limited contributions; difficult transition planning in a rapid scale-up environment; few domestic financing options beyond government subsidies and recently dramatic foreign aid cuts.
13. Considerable knowledge gaps with absence of an evidence-base (no applied scientific research) and limited quality education.[5]

APPROACH AND DESIGN

In many developing countries blood is often collected, processed and transfused in a policy environment lacking adequate regulatory controls or standards. Blood programs are often fragmented and dependent on independent factors and often limited to specific hospitals, e.g., the availability (or not) of trained staff, funds for procurement, a population of willing blood donors and competent prescribers (clinicians) of blood for transfusion.

DESIGN

Research was initiated to study the gaps inherent in these systems and exploring methodologies developed over the last three decades to address knowledge and structural barriers to safe, health system integrated and efficient blood transfusion systems, based on evidence through health sciences oriented research.

These projects were done by under- and postgraduate students and fellows as well as PhD fellows, guided by e.g., IQM Consulting (International Development of Quality Management in Transfusion Medicine) and other institutions, often in a bilateral between a western University and a University in the country of origin.

OBSERVATIONS

Despite the existing challenges (Table 1) global blood safety programs have developed a substantial body of (result oriented) methods to address challenges,[5-7] including:

- Assessment techniques and methodologies derived from field-based observations and studies;
- Focused Health Sciences research projects (International twinning);
- A growing evidence-base in the scientific and "gray" literature on best practices and other strategies to address the technical and policy gaps;
- Principles, ethics and technical guidelines for blood donation and clinical transfusion;

•Strategies to link blood safety programs and goals to broader development objectives, such as the Millennium Development and Sustainable Development Goals,[9, 10] Universal Health Coverage (UHC) program[11] and the WHO Model Lists of Essential Medicines, *in vitro* Diagnostics, and Medical Devices,[12-14] WHO EMRO (Eastern Mediterranean Regional Office) Strategic framework for blood safety and availability 2016-2025,[15] WHO Action framework to advance universal access to safe, effective and quality-assured blood products 2020-2023[5], WHO Global Patient Safety Action Plan 2021-2030.[16]

•Health Sciences oriented research and development projects at Master and PhD level, to build up the evidence base needed to improve and sustain achieved results.

More importantly, international blood safety and health science research projects[5,16] initiated by various foreign institutions over the last 30 years have identified several key common gaps in blood transfusion systems in countries with poor economics. These gaps are included in Table 2:

Table 2: Common gaps in blood transfusion systems in countries with poor economics.

1. Weak, outdated or unenforced legal and regulatory frameworks;
2. Low political awareness and focused action;
3. A lack of organizational infrastructure, including management capacity, communication channels, and unclear chains of command and job descriptions;
4. Incomplete pre- and in-service education and training opportunities;
5. Absence or poor education environments and climates;
6. Lacking or underutilized quality assurance standards (technical and managerial) and programs;
7. Low community awareness about blood donation, blood transfusion and the risks associated with both;
8. An inadequate pool of willing voluntary blood donors with low behavioural risk profiles for HIV and other blood transmissible infections;
9. Inconsistent and/or inefficient procurement/manufacturing (collection, processing and testing, storage and distribution) and supply logistics, especially cold-chain;
10. Weak hygiene and waste management systems (domestic and bio-hazardous);
11. Limited clinical awareness about appropriate and evidence based disease diagnosis and use of blood and alternatives;
12. Incomplete documentation, traceability and monitoring and evaluation systems, and a low level of applied research (Health Sciences oriented);
13. Inconsistent use of informed consent for donors and transfusion recipients;
14. Inconsistent patient blood management structures;
15. Inadequate or absent contingency and emergency planning (humanitarian, nature disasters, pandemics);
16. Uncertain financing or sustainability planning (corruption, foreign aid cuts).

The role which International donors (e.g., PEPFAR, EU, JICA, WB, ADB and USAID) play(ed) in strengthening NBTS in developing countries has been considerable, but has not been coordinated nor comprehensive. For instance the US PEPFAR program (President's Emergency Plan For AIDS Relief) has invested since 2004 over $250 million in blood safety programs worldwide, but investment in infrastructure including governance, stewardship

and leadership, research and development has not or inadequately been done.[17]

Investments in the recommendations of WHO Aide-Mémoires[18] and guidance documents[19] have produced impressive though short-term results such as increased collections from Voluntary Non-Remunerated Donors (VNRD); mostly first time only - decreased prevalence of HIV, HBV, HCV in donated units; development of policies and documentation systems, and application of more structured education and training programs.[2] However, sustainability remains a major challenge as a result of absence of ownership, incompetent and weak stewardship and leadership, inadequate funding and foreign aid, absence of monitoring and evaluation (mid and long term follow-up) and no or incidental benchmarking for improvement through applied Health Sciences oriented research.

CONCLUSION

Global blood safety and healthcare development programs have created a substantial body of methods to address the gaps observed and contributed to the development of Transfusion Medicine strengthening and integrating existing blood supply and consumption systems in national healthcare structures.
Resources include:

1.Assessment techniques and methodologies derived from field-based observations[7];

2.Focused Health Sciences oriented research projects [16,19];

3.A growing evidence-base in the scientific and "gray" literature on best practices and other strategies to address the technical and policy gaps[19];

4.Principles and ethical guidelines for blood donation and transfusion;

5.The WHA (World Health Assembly) and WHO EB (Executive Board) Resolutions and Recommendations since 1975[19];

6.Strategies to link blood safety goals to broader development objectives, such as the Millennium Development Goals (MDG, 2000-2015),[9] the Sustainable Development Goals (SDG, 2016-2030),[10] the UN Universal Human Rights Declaration (1948)[20], the UHC program[11] and the WHO Model Lists of Essential Medicines, *in vitro* Diagnostics and Medical Devices,[12-14] and the WHO Action Plans, guidance documents and Strategic frameworks.[5,15,16, 19]

Countries in the beginning of the process to strengthen their blood service (procurement and clinical use) may benefit from this growing knowledge base initiated through Health Sciences oriented research on how to develop evidence-based transfusion medicine 'vein-to-vein', integrating in the healthcare structure and eliminating or mitigating harm to patients.

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Conflict of Interest:

The author has no conflicts of interest to declare.

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References:

1.UNDP Human Development Index. Accessible at http://hdr.undp.org/en/content/human-development-index-hdi

2.WHO Blood Safety and Availability. Key Facts June 2020. Accessible at https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability

3.Abdella, YE, Hajjeh, R, Smit Sibinga, CTh. Review – Availability and safety of blood transfusion during humanitarian emergencies. *EMHJ* 2018;24:778-88

4.WHO Global Status Report on Blood Safety and Availability 2016. Geneva 2017. Licence: CC BY-NC-SA 3.0 IGO

5.WHO Action framework to advance universal access to safe, effective and quality-assured blood products. 2020-2023. Geneva, 2020. Licence: CC BY-NC-SA 3.0 IGO

6.Guidance to identify barriers in blood services using the blood system self-assessment (BSS) tool. Geneva, World Health Organization 2023. Licence: CC BY-NC-SA 32.0 IGO

7.Web annex in Guidance to identify barriers in blood services using the blood system self-assessment (BSS) tool. Geneva, World Health Organization 2023. Licence: CC BY-NC-SA 32.0 IGO

8.Smit Sibinga, CTh, Oladejo, MA. Management and Operations of Transfusion Medicine: Impact of Policy, Planning, and Leadership on Bridging the Knowledge Gap. In: Maki Habib ed. Handbook of Research on the Evolution of IT and the Rise of the E-Society. Chapter 20. IGI Global, Hershey, PA, USA 2018:438-54

9.UN Millennium Development Goals 2000-2015. Accessible at New country classifications by income level: 2019-2020. Accessible at http://blogs.worldbank.org/opendata/new-country-classifications-income-level-2019-2020

10.United Nations. Sustainable Development Goals. New York: United Nations; 2015. Accessible at https://sustainabledevelopment.un.org/?menu=1300 .]

11.WHO Universal Health Coverage. Accessible at http://www.who.int/universal_health_coverage/en/

12.WHO Model List of Essential Medicines, 21st edition Geneva, CH. 2019. Accessible at http://www.who.int/medicines/publications/essentialmedicines/21st_EML.pdf

13.WHO Model List of Essential in-vitro Diagnostics, 1st edition, Geneva, CH. 2018. Accessible at http://www.who.int/medical_devices/diagnostics/WHO_EDL_2018.pdf

14.WHO Global Model Regulatory Framework for Medical Devices including in vitro diagnostic medical devices. Geneva, CH. Licence: BY-NC-SA 3.0 IGO

15.WHO EMRO Strategic framework for blood safety and availability 2016-2025. Cairo, Egypt. Licence: CC BY-NC-SA 3.0 IGO

16.WHO Global Patient Safety Action Plan 2021-2030 'Towards Eliminating Patient Harm in Health Care'. Third Draft January 2021. Accessible at https://www.who.int/docs/default-source/patient-safety/global-patient-safety-action-plan-2021-2030_third-draft_january-2021_web.pdf?sfvrsn=948f15d5_17

17.Pitman JP. The Influence and Impact of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) on Blood Transfusion Services in Africa. *Case Studies from Namibia*. Grafimedia Facilitair Bedrijf RuG, NL. 2015

18.WHO Aide Mémoires. Accessible as pdf at https://www.who.int/bloodsafety

19.Abdella YE, Maryuningsih Soedarmono YS, Smit Sibinga CTh. Historical Background and Current Global Efforts. In: Eichbaum QG et al. Eds. Global Perspectives and Practices in Transfusion Medicine, Section 1 – History, Resolutions, Frameworks. AABB Press, Bethesda MD. 2023:1-26

20.Perspectives and Practices in Transfusion Medicine. Eichbaum QG et al. Eds. AABB Press, Bethesda, MD. 2023

21.United Nations Universal Declaration of Human Rights. 1948. Accessible at www.un.org/en/documents/udhr/nde.shtml