REVIEW

Paid donation and plasma trade: unrecognized forces that drive the AIDS epidemic in developing countries

Patricia Volkow MD¹ and Carlos del Rio MD²
¹Department of Infectious Diseases, Instituto Nacional de Cancerología, Av San Fernando 22, Mexico City, DF CP 14080, Mexico; ²Department of Medicine, Division of Infectious Diseases, and Centre for AIDS Research, Emory University School of Medicine, Atlanta, GA, USA

Summary: The commercial plasma industry and blood trade can fuel the transmission of HIV in a community by the most efficient way in which HIV is transmitted: the parenteral route. Paid donors get infected at the time of donation through practices like the re-use of needles, and/or injecting human blood. Paid donors from developing countries are a major source for plasma used by the pharmaceutical industry, that in 1999 fractionated 26 million litres. Paid donors also constitute an important source of blood for local use, contributing to rapid transmission of HIV through blood transfusion. This happened in Mexico in the 1980s and more recently in China. This route of HIV transmission can be efficiently prevented through a global safe blood programme and there is an urgent need to combat the epidemic.

Keywords: paid plasma donor, HIV, commercial plasmapheresis

More than a decade ago, paid plasma donation was hypothesized to be a risk factor for HIV infection in Mexico and Spain.¹⁻³ Subsequently, data showed the impact that commercial plasmapheresis and the blood trade had in the regional dissemination and rapid ‘feminization’ of the epidemic in Mexico.⁴⁻⁶ A variety of public health interventions that began in 1986 resulted in a dramatic decrease in transfusion-transmitted HIV/AIDS in Mexico (Table 1). However, without doubt, the intervention that had the greatest impact, limiting HIV transmission through blood and blood products, was the banning of commercial plasmapheresis and paid blood donation.⁷⁻⁹

The commercial plasma industry and blood trade can fuel the transmission of HIV in a community by the most efficient way in which HIV is transmitted: the parenteral route. Paid donors have been infected at the time of donation at plasmapheresis centres through practices like the reuse of needles, sharing of intravenous lines, injecting human blood to donors to hyperimmunize them for anti-Rho and typing serum production, and reinfusion of human red cells to another donor.¹⁰ These practices, seemingly inconceivable today, have been described in many countries, including the USA. They have led to outbreaks of blood-borne infections in the pre- and post-AIDS era and are, unfortunately, still occurring in many developing countries.¹¹⁻²⁴ Paid plasma donors also contribute to the spread of HIV by selling blood. In many middle- and low-income countries, paid donors still contribute in a high percentage to the blood transfused locally.²⁵ For example, as much as 30% of the blood transfused in Mexico, 50% in India and 60% in China at one time or another has come from paid donors.²⁶⁻²⁷ Since the main reasons for transfusion in these countries are obstetrical emergencies in women, chronic parasitic infection in children, and unintentional and war-related injuries, these practices lead to rapid and efficient transmission in the general population.

Persons who act as paid donors are often at high risk for blood-borne infections in the commercial plasmapheresis facilities. Their frequent utilization as a source for plasma used by the pharmaceutical industry often explains outbreaks of blood-borne infections among recipients of plasma products in high-income countries.²⁸⁻⁴⁹ To minimize this risk, the plasma fractionation industry has developed sophisticated methods of viral inactivation that
have reduced the likelihood of infection for the recipients of their products. However, high titres or agent-specific antibodies or even viral RNA have been reported in end plasma products since the 1970s and through the 1990s.49–53

The problem of HIV infection and commercial plasmapheresis has been extensively studied in Mexico, but it is clear that the problems seen in Mexico in the mid-1980s were not limited to that country and that the impact of the plasma trade on the HIV/AIDS epidemic is more extended than is commonly recognized by the medical community.54 In fact, the suggestion that commercial plasmapheresis was a danger to public health preceded the HIV epidemic. In 1975, a World Health Organization (WHO) publication warned about the potential harm of commercial plasmapheresis to human health.55 At that time, commercial plasmapheresis was a growing practice in many developing countries of sub-Saharan Africa and Latin America, including Zaire, Mexico, Haiti, Honduras and Brazil.55

The reach of the plasma trade has been enormous; Table 2 lists the amount of plasma used by the fractionation industry and the global market sales of this division of the pharmaceutical industry. Production, and thus plasma demand, increased in the 1980s and 1990s, two decades after the WHO warning, driven by market forces and virtually without any government control, either in the USA or in the European Community.56–58

Table 2 Estimates of plasma demand for fractionation of the American industry and annual sales for the fractionation industry worldwide; US firms provided 60% of sales in 1994

<table>
<thead>
<tr>
<th>Year</th>
<th>Source Plasma (L)</th>
<th>Source Plasma (US$)</th>
<th>Fractionated Plasma (L)</th>
<th>Total (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1,031,476 L</td>
<td>1,031,476 L</td>
<td>593,000 L</td>
<td>1,031,476 L</td>
</tr>
<tr>
<td>1971</td>
<td>2,150,000 L</td>
<td>2,150,000 L</td>
<td>593,000 L</td>
<td>2,150,000 L</td>
</tr>
<tr>
<td>1976</td>
<td>2,910,000 L</td>
<td>2,910,000 L</td>
<td>593,000 L</td>
<td>2,910,000 L</td>
</tr>
<tr>
<td>1978</td>
<td>1 billion</td>
<td>1 billion</td>
<td>593,000 L</td>
<td>1 billion</td>
</tr>
<tr>
<td>1979</td>
<td>3,950,000 L</td>
<td>3,950,000 L</td>
<td>593,000 L</td>
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</tr>
<tr>
<td>1980</td>
<td>5,760,000 L</td>
<td>5,760,000 L</td>
<td>10 million L</td>
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</tr>
<tr>
<td>1981</td>
<td>6,275,000 L</td>
<td>6,275,000 L</td>
<td>10 million L</td>
<td>6,275,000 L</td>
</tr>
<tr>
<td>1984</td>
<td>6,970,000 L</td>
<td>6,970,000 L</td>
<td>10 million L</td>
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<tr>
<td>1990</td>
<td>4 billion</td>
<td>4 billion</td>
<td>10 million L</td>
<td>4 billion</td>
</tr>
<tr>
<td>1991</td>
<td>12,000,000 L</td>
<td>12,000,000 L</td>
<td>20 million L</td>
<td>12,000,000 L</td>
</tr>
<tr>
<td>1999</td>
<td>26,000,000 L</td>
<td>26,000,000 L</td>
<td>5.9 billion L</td>
<td>26,000,000 L</td>
</tr>
</tbody>
</table>

Source plasma=plasma obtained through plasmapheresis for fractionation.

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Much of the plasma currently used by the industry continues to come from paid donors from developing countries. The plasma is trafficked by brokers (‘blood heads’) who relabel the plasma obtained from developing countries as coming from developed countries.56

The impact of the plasma and blood trade on the HIV epidemic has been difficult to assess and has been largely unrecognized by international agencies and HIV/AIDS experts. In most cases, HIV infection in paid donors has been attributed to other ‘more traditional’ risk factors such as injection drug use or sexual transmission, or categorized in the broad category of ‘transfusion-associated HIV/AIDS’ and hence not explored further. ‘Paid donor’ is not recognized as a risk category in any official WHO or UNAIDS epidemiological report.64

By the late 1990s, two countries spared by the AIDS epidemic had been seriously affected: South Africa and China. In South Africa, the sole explanation for the explosive growth of HIV in the second half of the 1990s was sexual transmission. However, in 2000, the lay press65 denounced the illegal exportation of millions of litres of tainted HIV and hepatitis C plasma extracted from Southern Africans in the second half of the 1990s, from Durban to Linz in Austria.66 Again, the extent to which plasma selling and contamination of paid donors may have contributed to the dramatic growth of the South African epidemic is almost impossible to evaluate, since the extraction of plasma in the Southern African countries was done illegally and there is no information regarding the donors who sold the plasma. In China, on the other hand, there is clear evidence of the role played by the plasma industry and paid donors in the spread of HIV/AIDS.67–73 In rural communities, an environment with little or no drug abuse or
prostitution, a large number of poor peasants sold their plasma within unsanitary plasmapheresis centres to supplement a subsistence income, a practice that was promoted by governmental authorities at the beginning of the 1990s. Up to 60% of adults have become infected with HIV in rural communities in the province of Henan in China. The tragedy that now faces China could have been prevented, and failure to have done so is prima facie public health negligence.

It is a safe assumption that neglect by international agencies and the medical community has contributed to the spread of HIV in many countries. A route of HIV transmission that could have been efficiently prevented through a global safe blood programme has continued unabated. A safe blood programme can only be achieved, however, with political will at the local level coupled with programme has continued unabated. A safe blood and regulation of the plasma industry in particular, abolishing the pervasive practice of buying plasma and blood from poor people in developing countries. Only such oversight will ensure safe transfusions for all people, and not just for citizens of high-income countries.25,26 As we now address the complex problem of bringing modern medical care for HIV to developing countries, their lack of medical infrastructure is becoming harder to ignore. The dissemination of HIV by medical routes, which has its base, ultimately, in this inadequate infrastructure, is barely a footnote in the global plan to control HIV.

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