

Cytomegalovirus (CMV) and Transfusion Therapy: Prevalence of CMV Seropositivity in a Portuguese Blood Donor Population (2007-2014)

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Background: Cytomegalovirus (CMV or human herpesvirus-5) is a common infection and not clinically significant in immunocompetent individuals. It's the most important herpesvirus with reference to transfusion and, as all human herpesvirus, has the capability to lie dormant in tissues after an acute infection. The risk of CMV infectivity is still a major problem in immunocompromised patients requiring transfusion therapy, and should be minimized in CMV-negative pregnant women, fetuses, premature infants and neonates, transplant recipients and other severely immunosuppressed patients.

The residual risk of transfusion-transmitted CMV infection is between 2.3% and 3% for leucocyte-reduced blood components, and the additional use of anti-CMV screened blood components decreases this risk to less than 1%, which, in our point of view, justifies the non-abandonment of CMV-seronegative blood bank inventories, especially in high prevalent populations.

There is substantial variation in the donor rates of CMV seropositivity described in the literature (20-95%) and it seems to be inversely related to improved hygiene and living conditions. The same principle applies to the seroconversion rate per year.

Aims: To determine the prevalence of CMV seropositivity and CMV seroconversion rate per year in a Portuguese blood donor population over an eight-year period of time (2007-2014), and compare it to those mentioned in other studies.

Methods: Blood samples from donors were analyzed during the period 2007-2014 (8 years), and tested for detection of anti-CMV antibodies ("total" anti-CMV ELISA-based assays, capable of detecting both IgG and IgM class antibodies- Siemens Enzygnost[®] Anti-CMV/IgG+IgM), as they belonged to a first-time or to a previously tested CMV-seronegative donor. The prevalence of CMV seropositivity and the seroconversion rate per year were retrospectively determined among this blood donors population.

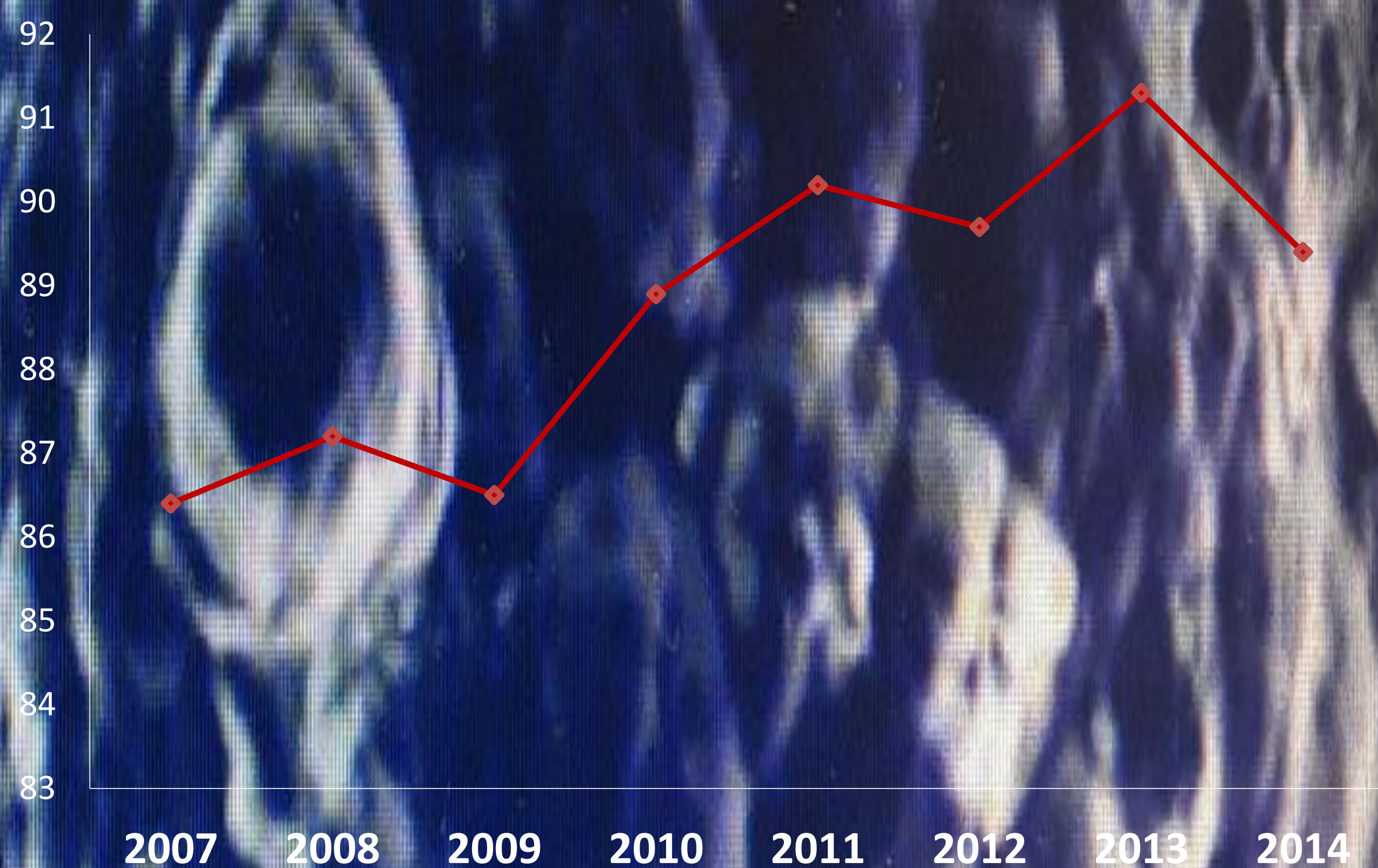


Fig. 2 – Seroprevalence (%) of CMV antibodies in a cohort of 30829 blood donors (2007-2014)

Results: A total of 42.286 blood collections were analyzed. The prevalence of CMV infection was determined for each year: 2007-86,4%; 2008-87,2%; 2009-86,5%; 2010-88,9%; 2011-90,2%; 2012-89,7%; 2013-91,3%; 2014-89,4%. The CMV seroconversion rate per year was 1,43% (average age of seroconversion 36,4 years old; 81,8% men and 18,2% women).

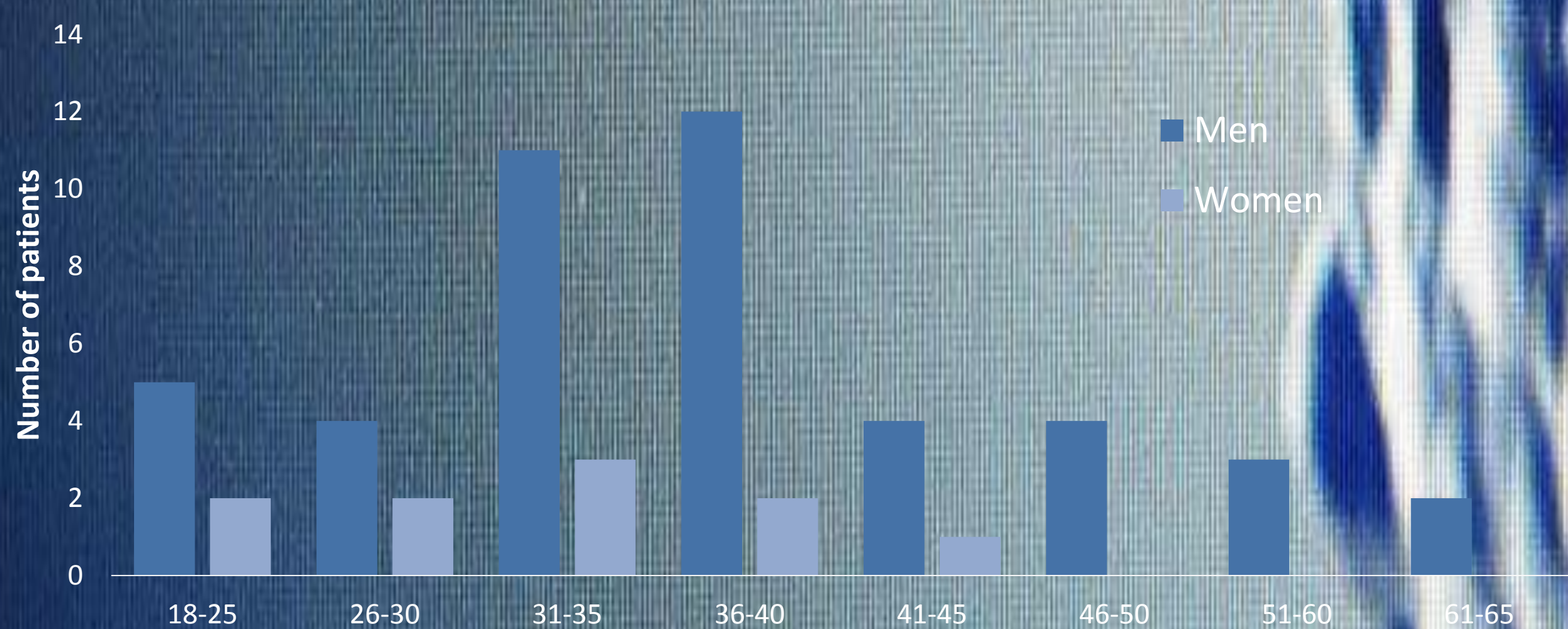


Fig. 1 – Analysis of CMV seroconversion (relative to gender and age)

Summary/Conclusions: All blood components transfused in Portugal are leucocyte-reduced. We try to provide CMV seronegative blood components to all patients in high risk of CMV infection, which is particularly difficult because of the high prevalence of CMV seropositivity in our blood donors population (approximately 89%).

There were no reported cases of transfusion-transmitted CMV infection during the time period analyzed, which confirms that our strategy is effective in preventing CMV infection, even in a high prevalent population as ours.

The existence of CMV-seronegative blood bank inventories does not reflect practice countrywide, but is still important for some high-risk groups of patients, and allows us to respond to the needs of our hospital and other institutions (whenever possible).