WHO ARE THE PATIENTS WE ARE TRANSFUSING?

16th INTERNATIONAL HAEMOVIGILANCE SEMINAR

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BANC DE SANG I TEIXITS

Do we know what we eat?

Do we know what we like?

Do we know what we buy?

Do we really know patients we are transfusing?

Qui sont les receveurs de produits sanguins labiles (PSL) ? Une étude nationale multicentr transfu

Epidemiology of blood transfusion

The epidemiology of blood component transfusion in Catalonia, Northeastern Spain

M. Alba Bosch, Enric Contreras, Pedro Madoz, Pilar Ortiz, Arturo Pereira, and M. Mar Pujol on behalf of the Catalonian Blood Transfusion Epidemiology Study Group

Volume 51, January 2011 TRANSFUSION 105

Vamvakas EC and Taswell HF. Transfusion. 1994 Jun;34(6):471-7
Vamvakas EC. Transfus Med Rew. 1996 Jan;10(1):44-61
Cobain TJ, Vamvakas EC et al. Transfus Med 2007 Feb;17(1):1-15
Quaranta JF, Berthier F, Courbil R et al. Transfus Clin Biol 2009;16:21-9
Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

Transfusion support is a cornerstone in the treatment of many patients affecting directly their **survival** and **quality of life**.

Grimshaw K, Sahler J et al. Transfusion. 2011 Apr;51(4):874-80

Blood components are scarce and not without risks so they must be transfused **only** when they are **necessary**.

Gilliss BM, Looney MR, Gropper MA. Anesthesiology. 2011 Sep;115(3):635-49
Sinha R, Roxby D. Transfus Apher Sci. 2011 Oct;45(2):171-4

Patterns of **use of blood** components **change** continuously:

- **Evolution** of medical and surgical practices.
- Appearance of **new drugs** or blood-saving techniques.
- **Better perception** of transfusion risks by prescribers.
- Efforts in **monitoring and control** the use of blood components.

Verlicchi F, Facco G et al. Blood Transfus. 2011 Oct;9(4):430-5
Murphy MF, Stanworth SJ et al. Vox Sang. 2011 Jan; 100(1):46-59
Stanger SH, Yates N et al. Transfus Med Rev. 2011 Oct 20

The **increasing** of transfused patients **directly affect** Transfusion Services.

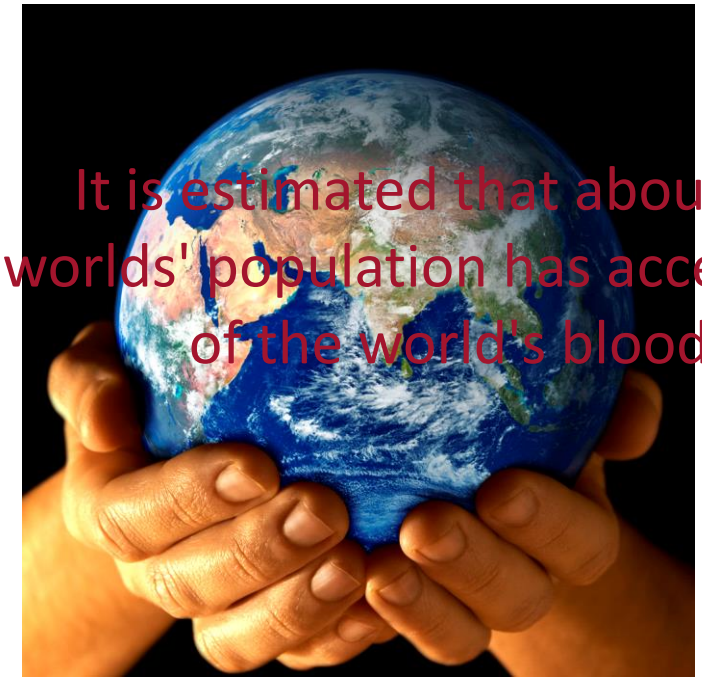
- Quantitative impact
- Qualitative impact

Folléa G, de Wit J, Rouger P. Transfus Clin Biol. 2011 Apr; 18(2):106-14
Renaudier P. Transfus Clin Biol. 2008 Nov;15(5):247-53

Differences in transfusion practices are not often related to the patients characteristics but with **individual** prescribers **criteria**.

Murphy MF, Wallington TB et al. Br J Haematol. 2001 Apr;113(1):24-31

Transfusion of blood and blood compon
common medical **procedure** perform
world.



It is estimated that about 80% of the worlds' population has access to only 20% of the world's blood supply.

McCullough TK, McCullough J. Transfus Apher Sci. 2013 Dec;49(3):408-15

Despite this common use, **transfusion** continues to be dogged by **controversies**.

Ansari S, Szallasi A. Blood Transfus. 2012 Jan;10(1):28-33

Blood transfusion is a double-edged sword that **"still kills"** some and is believed to exert **adverse effects** in many more.

Blood is a commodity that is getting increasingly **expensive** and sometimes in **short supply**.

Vamvakas EC, Blajchman MA. Transfus Med Rev 2010;24: 77-124

This mandates the **review** of transfusion practices to ensure the **rational use** of blood components.

Folléa G, de Wit J, Rouger P. Transfus Clin Biol. 2011 Apr;18(2):106-14

Any medical or surgical intervention has its **risk**, but in principle, these should be offset or **justified** by immediate or long-term **benefits**.

Transfusion assessment is one of the more complex decisions made by medical practitioners.

It has shown remarkable differences in transfusion triggers in patients with similar or even identical diagnoses.

Frank SM, Resar LM, Rothschild JA et al. Transfusion. 2013 Dec;53(12):3052-9

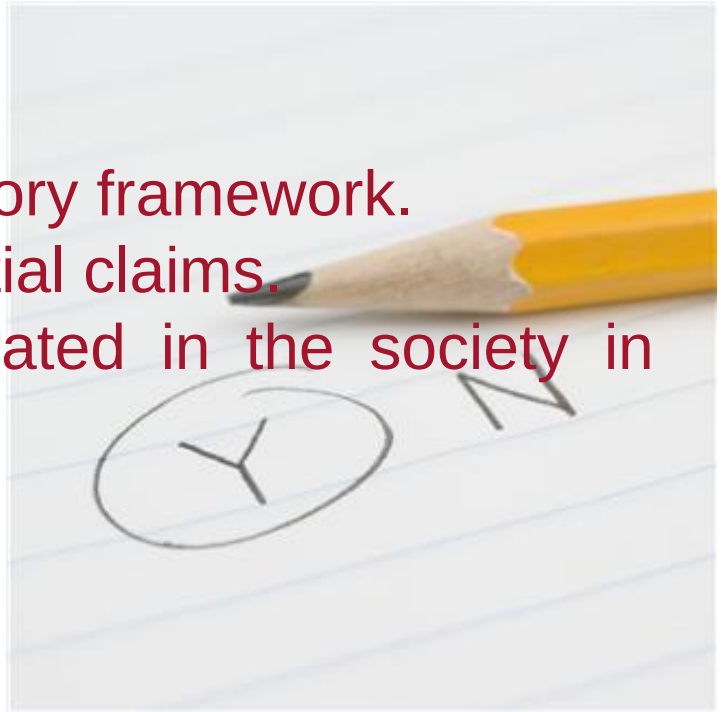
Historically many **studies** about **transfusion practices**
Conservative vs liberal policies
focusing the classic question
How many units should be necessary to transfuse?

Any regard to the patient's **characteristics**, especially age and associated comorbidity.

Carson JL, Carless PA, Hebert PC. Cochrane Database Syst Rev. 2012 Apr 18;4:CD002042

Transfusion decision, rather than on clinical evidence, often relies:

- Numbers.
- Restrictive and punitive regulatory framework.
- Prescriber's fear against potential claims.
- Excess of expectations generated in the society in case to be transfused.



Szczepiorkowski ZM, Dunbar NM. Hematology Am Soc Hematol Educ Program. 2013;2013:638-44

Prescriber's decision **must not** be based **just in numbers** and must always weigh those results related with anemia, plaquetopenia or clot factors disorders.

Transfusion **indication** should be considered as a **clinical decision based on the patient**, analytical data and a proper **assessment of the risk / benefit** for the patient's behavior.

Williamson LM, Devine DV. Lancet. 2013 May 25;381(9880):1866-75

In the absence of more uniform criteria, **consensus guidelines** will be the only element in which transfusion **decisions** may be based.

It urges the establishment of policies and management guidelines based on evidence and **focused** on the **patient**.

Blajchman MA, Slichter SJ et al. Hematology Am Soc Hematol Educ Program. 2008:198-204

When to transfuse?

- It's an **individualized** decision based in a specific **patient**.
- Proper transfusion **indication**.
- Selection of the most **suitable** blood component to the **patient's needs**.
- Accurate **dosage** of the prescribed component.
- Correct administration by **qualified staff.**

Blajchman MA, Slichter SJ et al. Hematology Am Soc Hematol Educ Program. 2008:198-204

Patient blood management shows that **transfusions** can be **minimized** in many cases by the implementation of thoughtful processes often beginning days or even weeks before the actual decision to transfuse or not is being made.

Edwards J, Morrison C, Mohiuddin M et al.Transfusion. 2012 Nov; 52(11):2445-51

Transfusion medicine is moving from a component safety emphasis to **patient-centered decision making**, focusing on holistic **patient management**.

Edwards J, Morrison C, Mohiuddin M et al.Transfusion. 2012 Nov; 52(11):2445-51

Answers can be sought in multiple randomized **clinical trials**.

- Are the assumed **benefits** of transfusion **universal** or are they **limited** to only a well-defined population of patients?
- What **triggers** should be used to administer blood components and when should transfusions occur?
- What component **dose** is enough and/or necessary to confer clinical **benefit**?.

Blajchman MA, Slichter SJ, Heddle NM, Murphy MF .Hematology Am Soc Hematol Educ Program. 2008; :198-204

The next step is to translate this information into widely adopted and **consistent practice** through the development of transfusion practice **guidelines** that can become a part of comprehensive **PBM**.

Theusinger OM, Felix C, Spahn DR. Curr Opin Anaesthesiol. 2012 Feb;25(1):59-65

Transfusion Medicine has transformed from **blood procurement** and **matching** to a dynamic field where **translational and clinical research** is essential to guarantee the safest blood products.

Hillyer CD, Blumberg N, Glynn SA. Ness PM. Transfusion 2008;48:1530-7

We should **focus** or work:

- Improve transfusion practices knowledge and their associated clinical settings, outcomes, and costs.

Folléa G, de Wit J, Rouger P. Transfus Clin Biol. 2011 Apr; 18(2):106-14

- Improve transfusion practice knowledge in **key patient populations**:
  - women
  - racial or ethnic minorities
  - elderly
  - patients with hemoglobinopathies
  - neonates and children.

Goodnough LT, Shieh L, Hadhazy E et al. Transfusion. 2013 Oct 10. doi: 10.1111/trf.12445

- **Identify** the risks, benefits, and clinical goals of prophylactic *vs* therapeutic transfusion strategies and **assess** the potential clinical benefits from modified products or treatment strategies.

Wandt H, Schaefer-Eckart K, Wendelin K et al. Lancet. 2012 Oct 13;380(9850):1309-16

With this **information** possibly we should **answer questions** related to:

- Patient characteristics, diagnoses and product utilization.
- Indications for transfusion for any component.
- Outcomes data comparing transfused and nontransfused patients that are well controlled for potential confounders.

Hillyer CD, Blumberg N, Glynn SA. Ness PM. Transfusion 2008;48:1530-7

The **aging population** in developed countries is **increasing** blood component **transfusion**.

Quaranta JF, Berthier F, Courbil R et al. Transfus Clin Biol 2009;16:21-9

>50%

Older than 65

70-74 years old

Quaranta JF, Berthier F, Courbil R et al. Transfus Clin Biol 2009;16:21-9

WHO ARE THE PATIENTS WE ARE TRANSFUSING? ARE THE PREVENTIVE MESURES SUITABLE FOR THE EPIDEMIOLOGICAL PROFILE OF OUR PATIENTS?

- It is estimated that in 2030 25% of the **population** will be **over 65** years old (12.5% in 2010).
- This population **generates** 34% of all **hospitalizations** and accounts for 60% of all **transfusion** episodes.

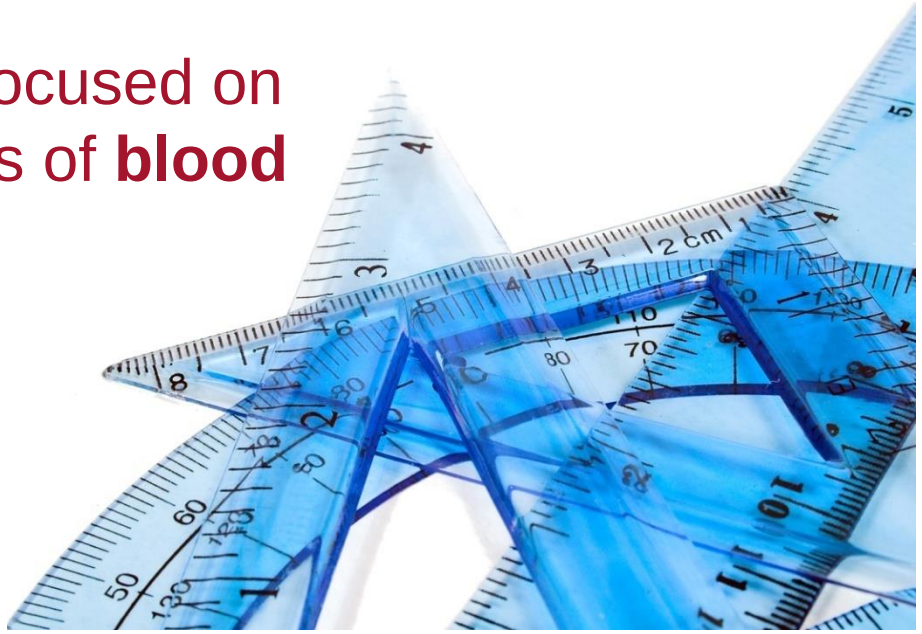
Quaranta JF, Berthier F, Courbil R et al. Transfus Clin Biol 2009;16:21-9

- Clear **decline** during the last decade of **blood** use in **surgical** areas.

- There were **not significant changes** in non surgical areas.
  - Onco-haematological (46%)
  - Gastrointestinal bleeding (17%)

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

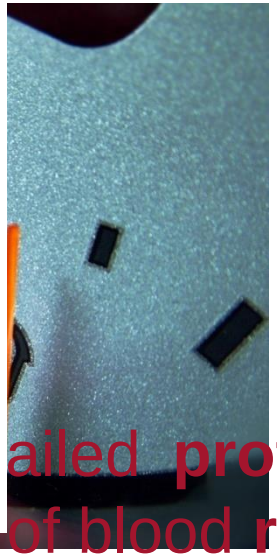
There are relatively few studies focused on the **epidemiologic** characteristics of **blood recipients**.



Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116
Quaranta JF, Berthier F, Courbil R et al. Transfus Clin Biol 2009;16:21-9
Wells AW, Mounter PJ, Chapman CE et al. BMJ 2002 Oct 12;325(7368):803
Vamvakas EC, Taswell HF. Transfusion 1994;34:464-70

To **know** the relative utilization by **specific** clinical conditions and **diagnostic** or **therapeutic procedures**.

Epidemiologic studies could **improve** the ion **resources**.

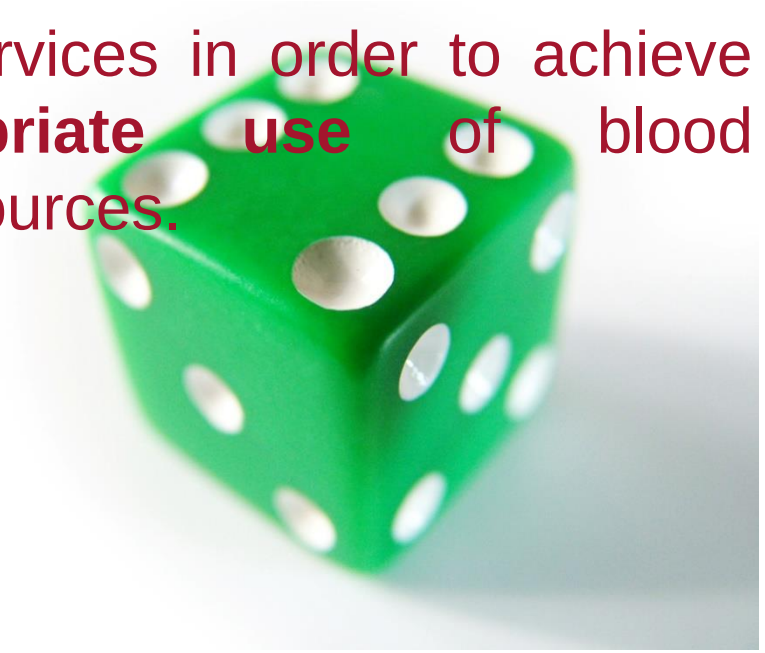


ailed **profile** of the demographic and **clinical features** of blood **recipients**.

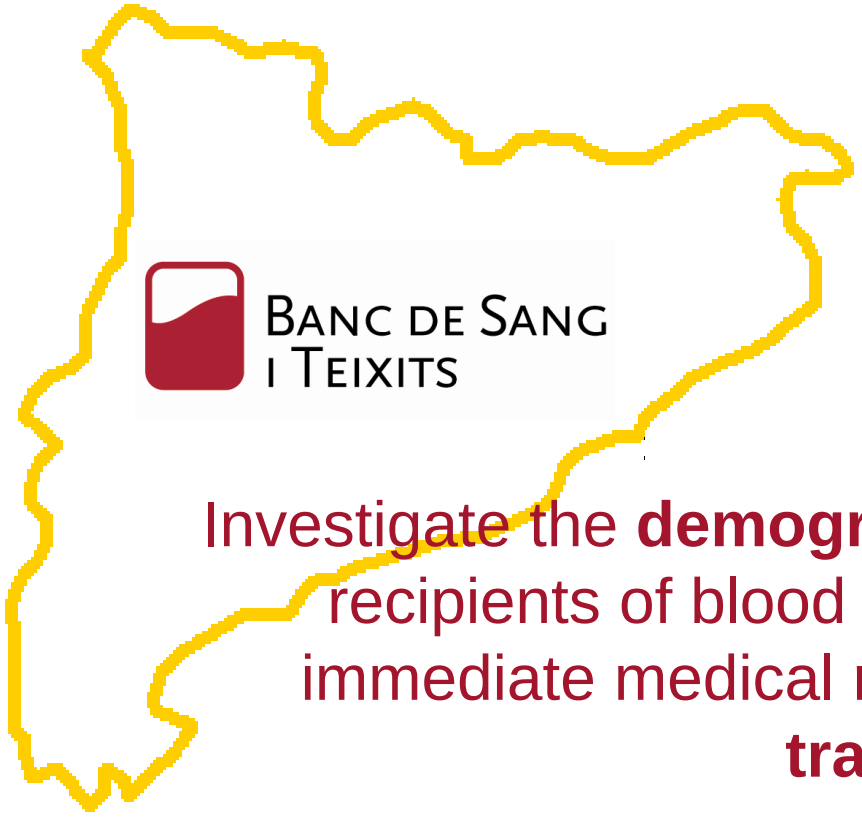
Cobain TJ, Vamvakas EC, Wells A et al. Transfus Med. 2007 Feb; 17(1):1-15
Vamvakas EC, Taswell HF. Transfusion 1994;34:464-70

To help the **prediction** of long-term **needs** for blood **transfusion**.

To **benchmark** with other Blood Transfusion Services in order to achieve more **appropriate use** of blood transfusion resources.



Cobain TJ, Vamvakas EC, Wells A et al. Transfus Med. 2007 Feb; 17(1):1-15
Vamvakas EC, Taswell HF. Transfusion 1994;34:464-70



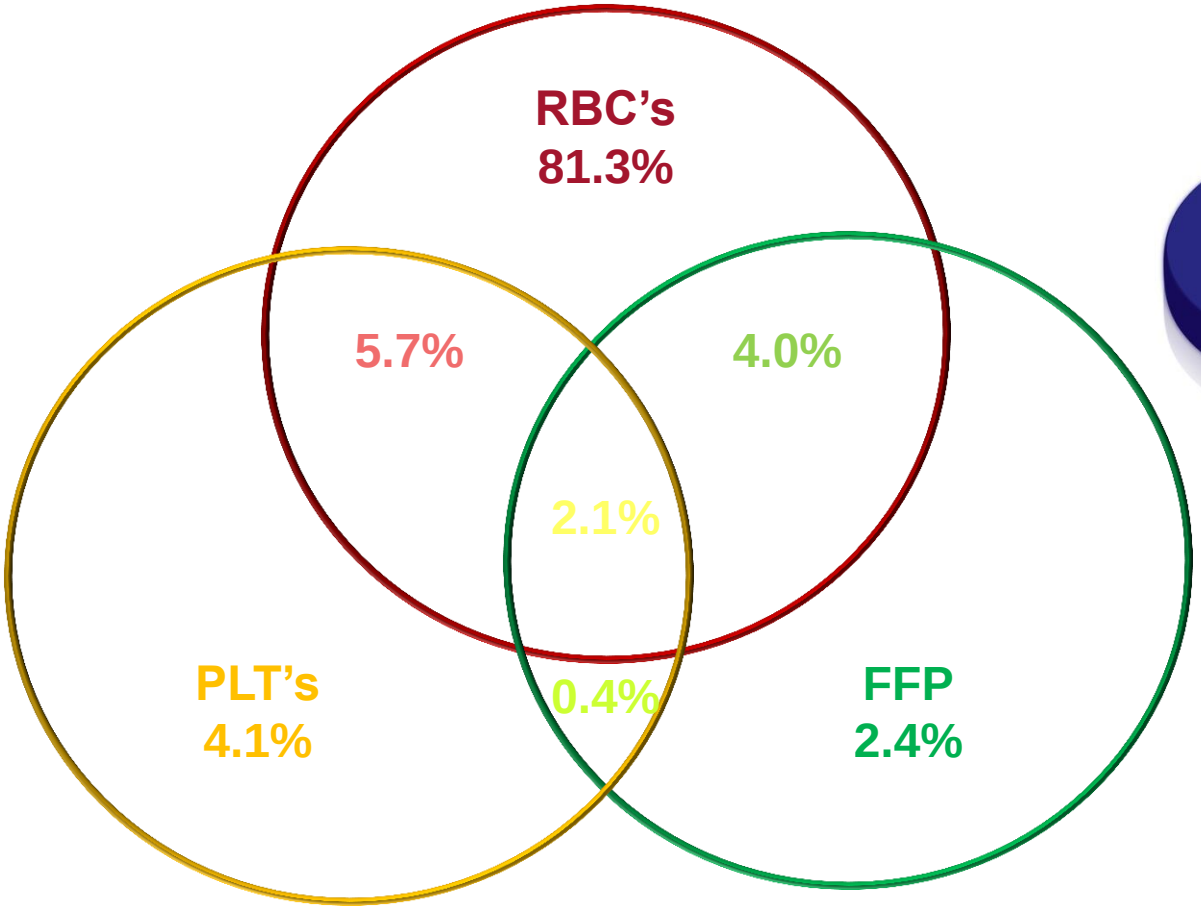
Investigate the **demographic** and **clinical features** of recipients of blood components, including the immediate medical reason behind the **need for transfusion**.

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

To predict the **future** blood transfusion **needs** to better characterize the public **health impact** of transfusion safety measures.To ascertain received by t

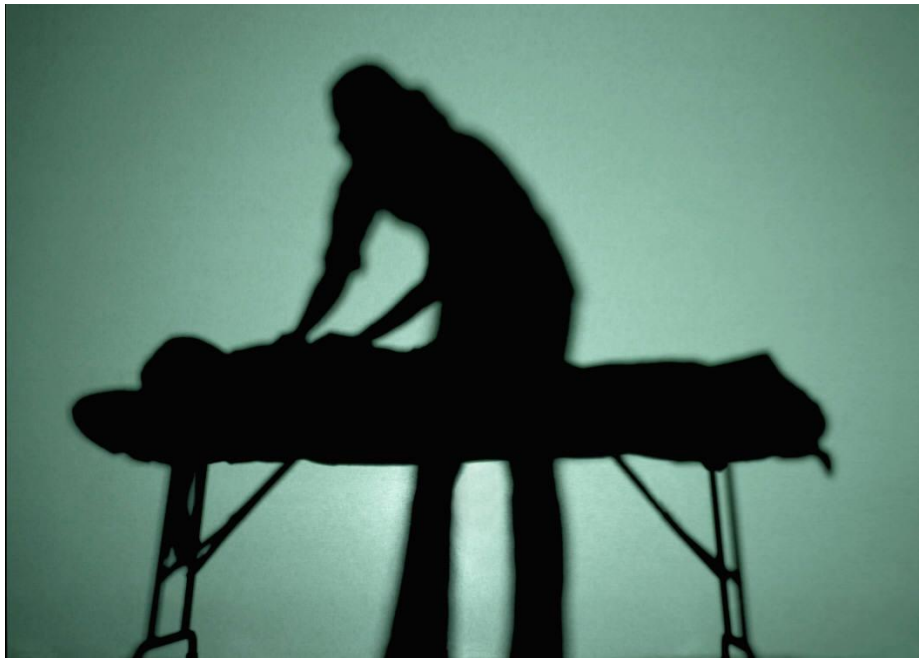
To identify **tran** susceptil

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116



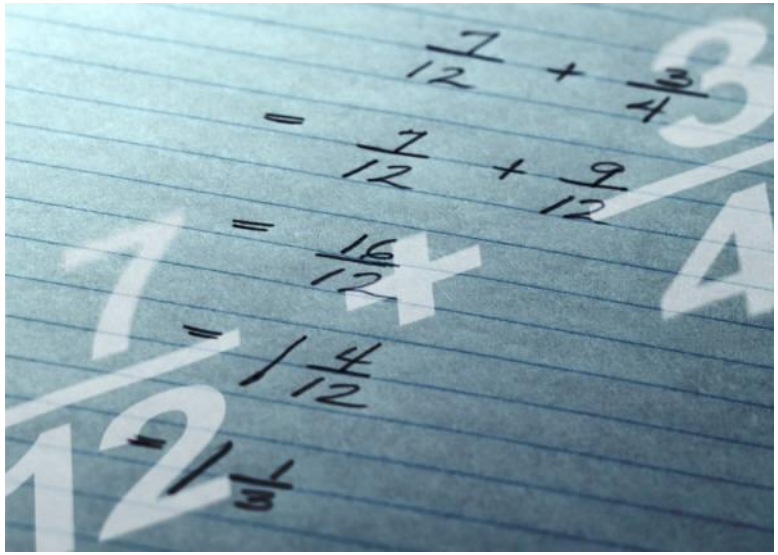
Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

Patient median **age** was 71 where 5.4% were younger than 15



Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

Patients who receive only **FFP or PLTs** without RBCs account or **less than 7%** of all blood recipients.



Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

Are we **focusing correctly** those **safety** measures to blood components that **only represents** the 19% of the whole blood transfused components?.

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

The **RBC transfusion** incidence rate (35 u/1000 person-years) was **lower** than most of the European countries possibly due to **differences** in **transfusion practices**.

Blood diseases (26%) and **neoplasms** (20,5%) account for almost 50% of the total **red blood cell** transfusion. **Circulatory** diseases (15,8%) and **digestive** system diseases (13,6%)

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

Demographic and clinical characteristics of RBC recipients anticipate that the potential for **saving blood** is severely **limited**.

Blood-sparing techniques have demonstrated the **greatest** potential in the **young** or middle-aged patient submitted to **elective surgery**.

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

The **FFP** incidence rate (6 u/1000 person-years) were **higher** than other European countries but comparisons are further compounded by the **heterogeneity of plasma products** or manufactured derivatives in certain clinical conditions.

90,1% of FFP transfusions had an inappropriate indication

More than 40% of all FFP transfused are **associated to bleeding**.

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

PLT transfusion incidence rate (3 doses/1000 person-years) **comparable** to that found in other European countries.

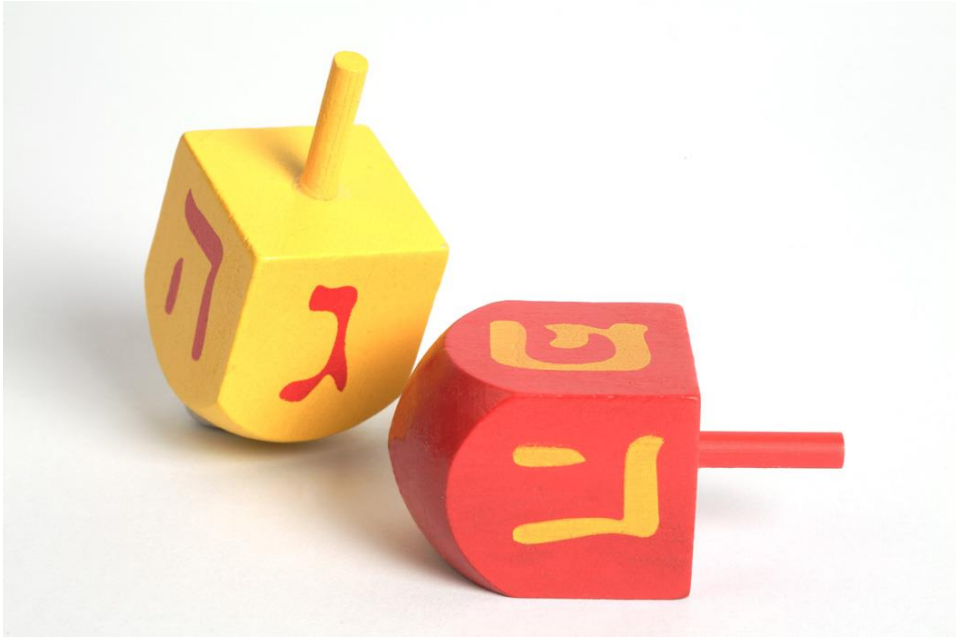
- **Hematologic diseases** and neoplasms account for nearly 75% transfused PLTs.
- 67% of PLT transfusions are given for **bleeding prophylaxis** in thrombocytopenic patients.

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

The **high use** of overall PLT to the prophylaxis of spontaneous bleeding in oncohematology patients calls for **efforts** aimed at **optimizing this consumption**.

Bosch MA, Contreras E, Madoz P, et al. Transfusion 2011;51:105-116

Summary…..



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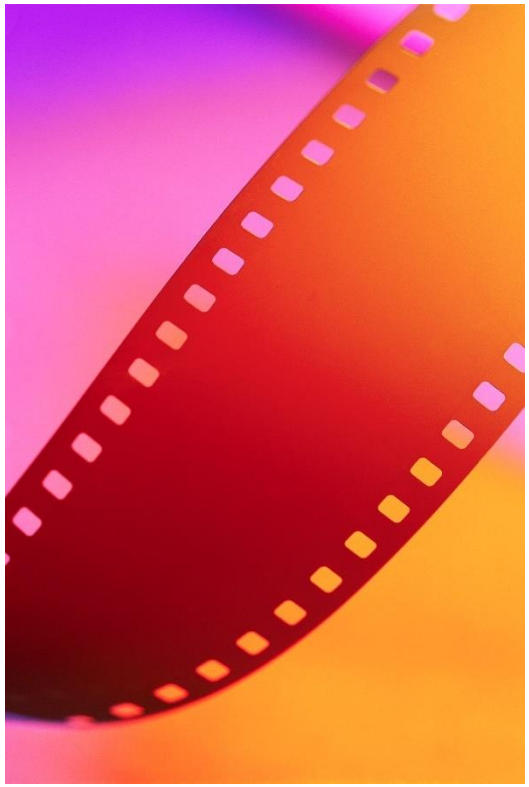

Epidemiological profiles are still a **photograph** of the blood component transfusion.

It would be necessary to **repeat** these cross-sectional surveys to have a **dynamic** view of blood component utilization and to capture the most **relevant trends**.

It should be necessary to **evaluate** the clinical **appropriateness** of individual **transfusions** which would be very valuable to improve transfusion practices.

King R, Michelman M, Curran V et al. South Med J. 2013 Jun;106(6):362-8

Long-term **predictions** based only on demographic profiles are subjected to several **sources of uncertainty**.

Greinacher A, Fendrich K, Brzenska R et al. Transfusion. 2011 Apr;51(4):702-9

Transfusion is used by virtually all medical and surgical specialties but we still have to **learn** a bit more about what patients might actually **benefit** more from it.

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We have yet a rudimentary **understanding** of how a well-known and less-well-known elements in transfused components alter immunologic, biochemical, vascular, organ-specific and/or hemostatic **functions** in patients.

We must improve the process of elaboration of the different blood components ensuring **quality, safety and benefits** for patients.

Answers?

- How blood **transfusion** is currently **employed** in clinical practice?
- How could be **tabulated** the risks and benefits of transfusion to be analyzed and understood from a mechanistic point of view?
- Which technologies and practices will likely **improve** the appropriate use and clinical outcome of **blood transfusion**?

This research is relevant to **public health** due to a large and pervasive impact on clinical **outcomes** and the **costs** of health care.

*Patients are seeking **quality of life** while doctors look for **survival***

Pidala J, Anasetti C, Jim H. Blood. 2009 Jul 2;114(1):7-19

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