

# I patogeni storici riemergenti

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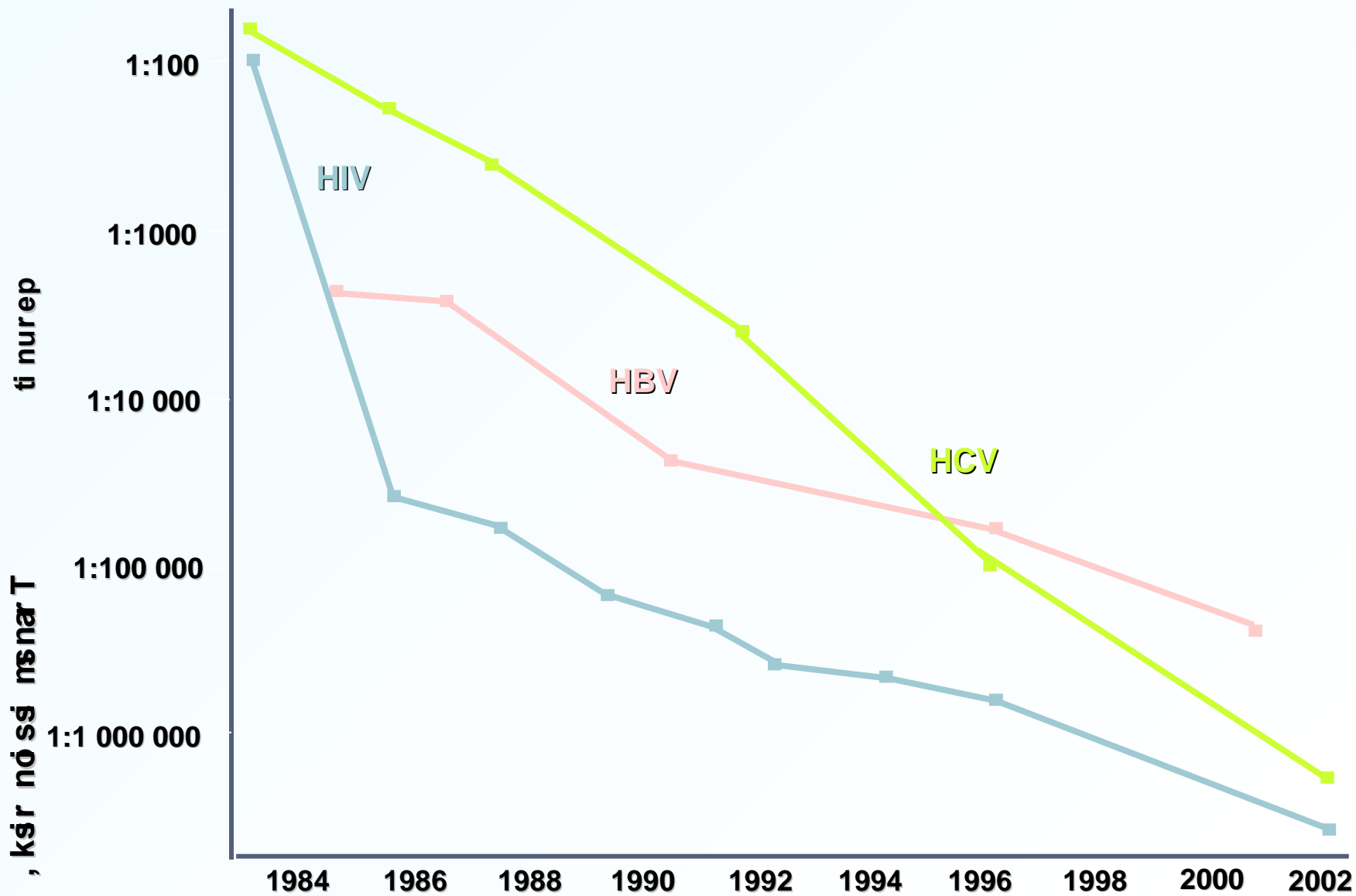


# HIV

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- First reports of transfusion-transmitted HIV in 1982
- Blood product testing began in 1985
- transmitted through parenteral, sexual exposure
- Variable latency period
- Antibody titer detectable ~ 45 days post-infection
- Common symptoms include night sweats, weight loss, diarrhea, thrush, purpura
- Infection chronic, but viral load abated with multi-drug therapy
- Risk of transmission 1/563,000

# Rischio associato alla Trasfusione (CDC - USA)

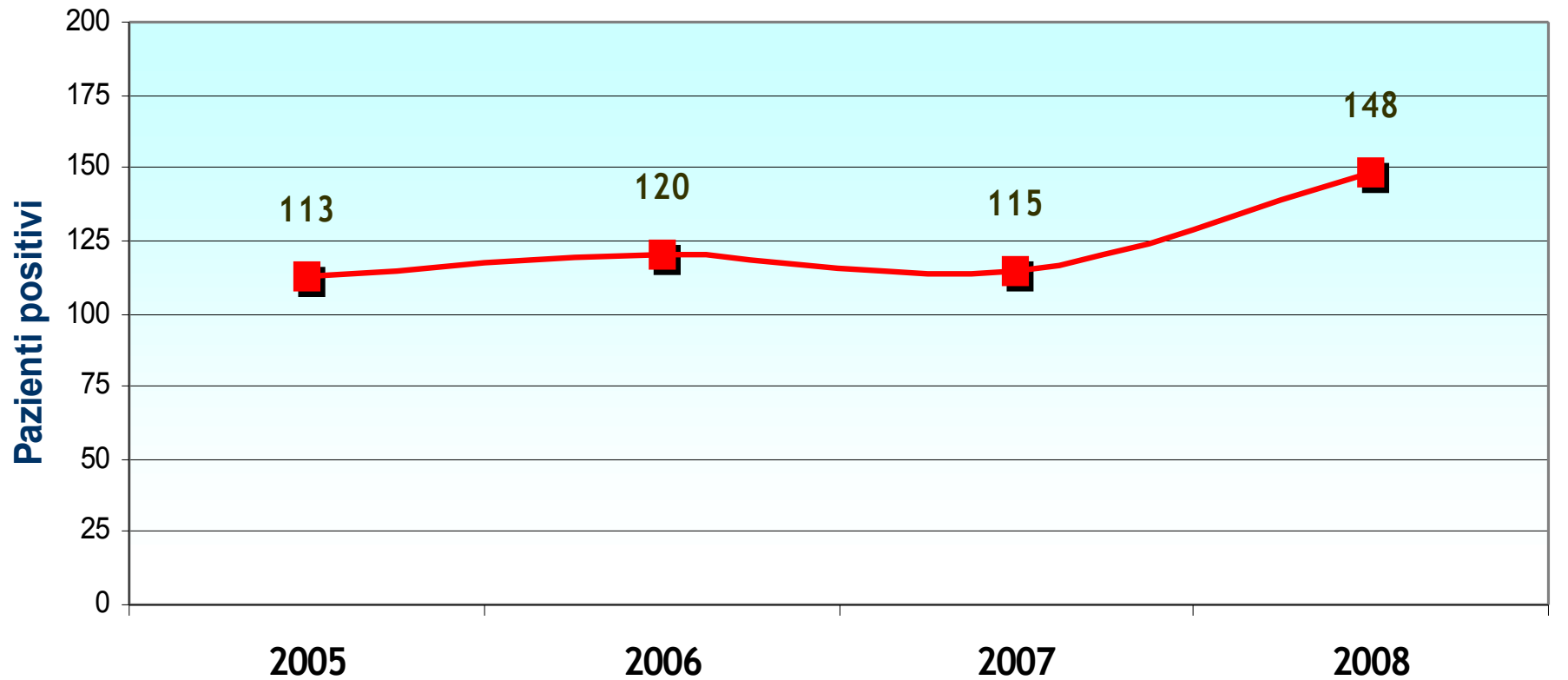


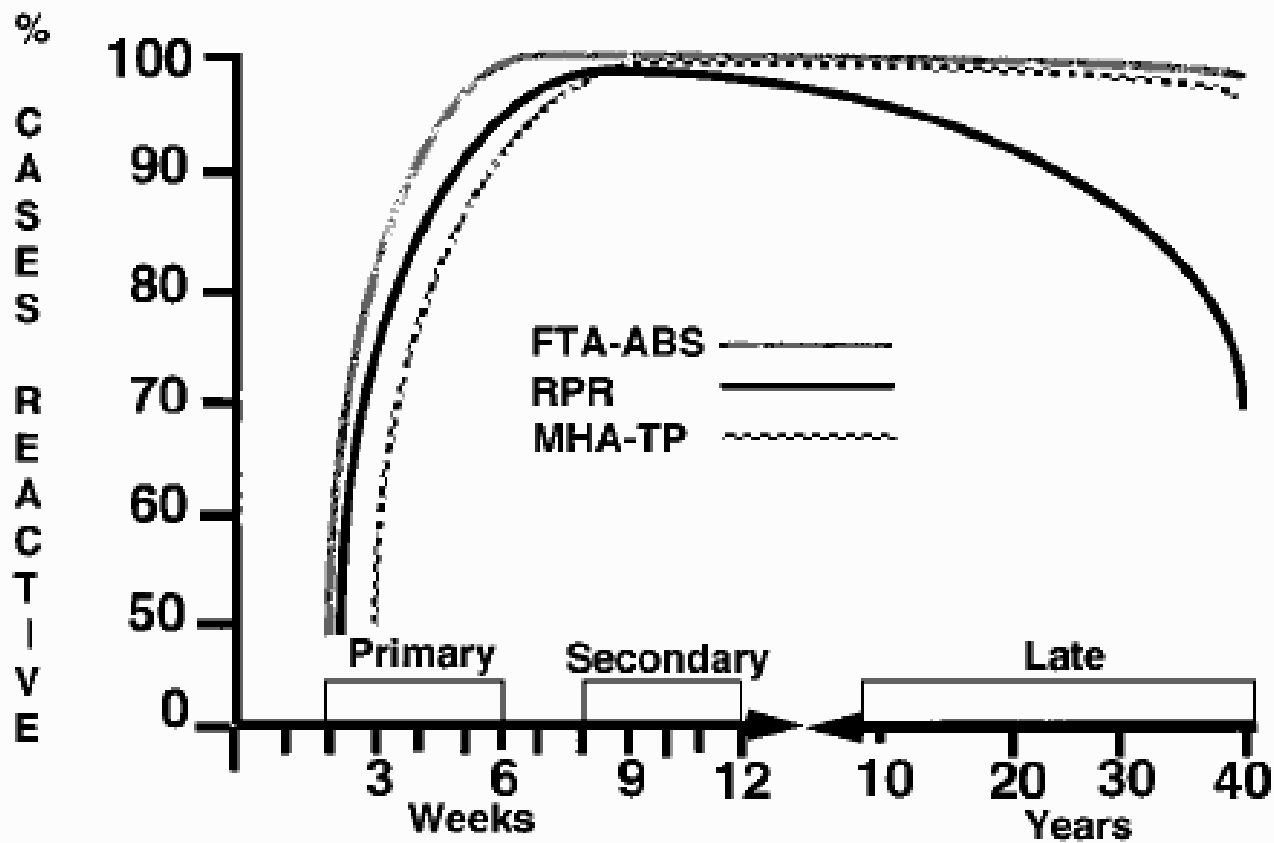
# Il vecchio... sempre presente



Azienda Ospedaliera  
Ospedale Niguarda Ca' Granda

## Diagnosi Sierologica di Infezione da HIV





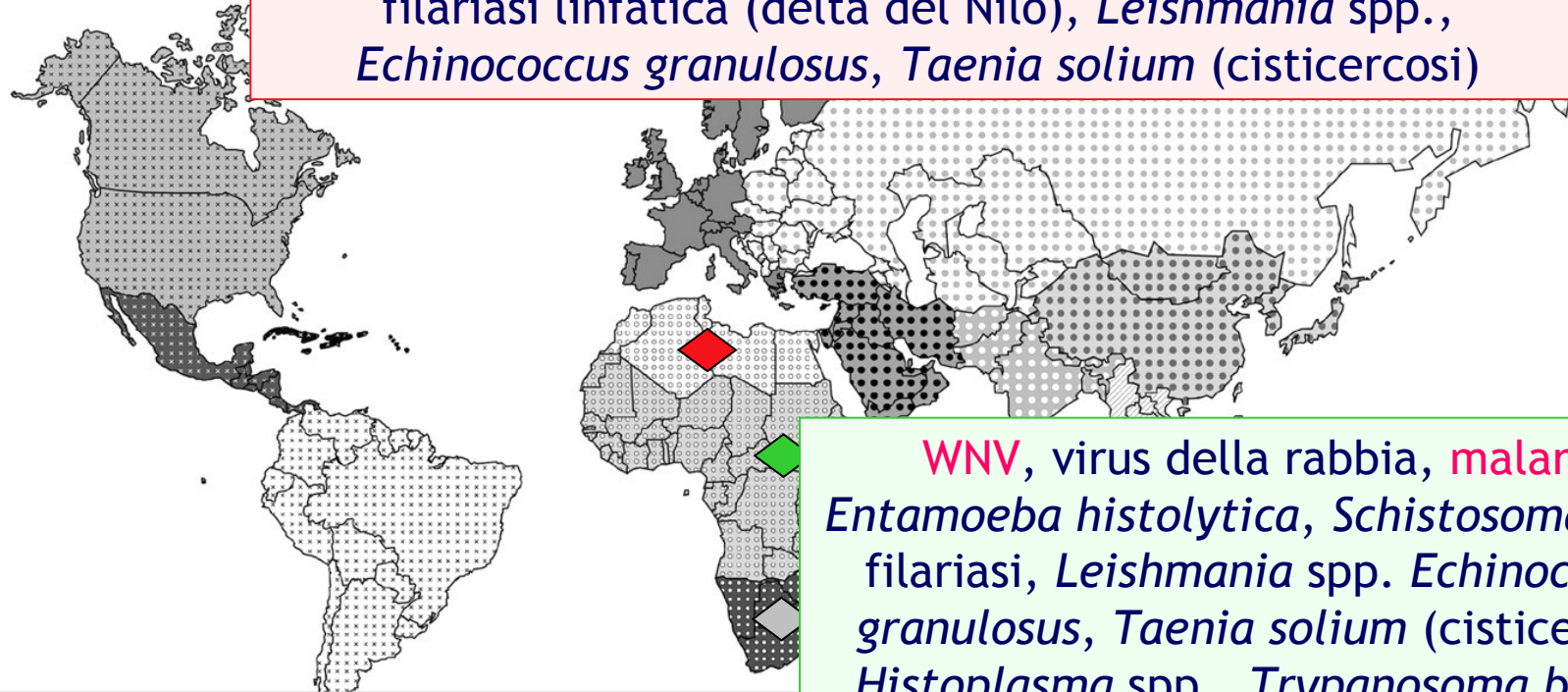


# Sifilide

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- “Il grande imitatore”
- Trasmessa tramite rapporti sessuali
- Raramente per via trasfusionale (2-3 segnalazioni in 30 anni)
- Sieroconversione si verifica dopo la spirochetemia
- L’infezione non trattata progredisce attraverso stadi multipli
- La positività per sifilide è considerata un marker comportamenti ad alto rischio

WNV, virus della rabbia, **malaria** (rischio molto basso), *Entamoeba histolytica*, *Schistosoma* spp. (delta del Nilo), filariasi linfatica (delta del Nilo), *Leishmania* spp., *Echinococcus granulosus*, *Taenia solium* (cisticercosi)



WNV, virus della rabbia, **malaria**, *Entamoeba histolytica*, *Schistosoma* spp., *Histoplasma* spp., *Trypanosoma brucei*

Caribbean  
South America

South Africa

WNV, virus della rabbia, **malaria**, *Entamoeba histolytica*, *Schistosoma* spp., filariasi, *Leishmania* spp. *Echinococcus granulosus*, *Taenia solium* (cisticercosi) *Histoplasma* spp., *Trypanosoma brucei*, HTLV-1 (in alcuni Paesi), *Strongyloides* spp.

Eastern Europe and Russia  
East Asia  
Indian Subcontinent  
Southeast Asia  
Oceania

**WNV**, virus della rabbia, *Coccidioides immitis*,  
*Histoplasma* spp., *Blastomyces* spp., *Strongyloides* spp.,  
*Echinococcus multilocularis*, *Babesia* spp.

**WNV**, virus della rabbia, *Coccidioides immitis*,  
*Histoplasma* spp. *Paracoccidioides* spp., **malaria** (prev.  
*P. vivax* ma anche *P. falciparum* a Panama), *Leishmania*  
spp., *Entamoeba histolytica*, ***Trypanosoma cruzi***,  
*Strongyloides* spp., *Taenia solium* (cisticercosi)

**HTLV-1**, *Histoplasma* spp., **malaria** (*Plasmodium falciparum* a  
Haiti e Rep. Dominicana, casi isolati in Giamaica), filiasi  
linfatica (Haiti e Rep. Dominicana), leishmaniasi cutanea  
(Rep. Dominicana), *Schistosoma* spp.

**HTLV-1**, virus della rabbia, *Histoplasma* spp., *Coccidioides immitis*,  
*Paracoccidioides* spp., **malaria** (in alcuni Paesi), leishmaniasi viscerale e  
mucocutanea, *Trypanosoma cruzi*, *Entamoeba histolytica*, filiasi linfatica (in  
alcuni Paesi), *Strongyloides* spp., *Taenia solium* (cisticercosi), *Echinococcus*  
*granulosus* *Echinococcus multilocularis*, *Schistosoma* spp.




Virus della Rabbia, *Histoplasma* spp. (Mediterraneo), *Blastomyces* spp. (Mediterraneo), Leishmaniasi viscerale e cutanea (Mediterraneo), *Echinococcus granulosus*, *Babesia* spp.



WNV, Virus della Rabbia, **malaria** (in alcuni Paesi), *Leishmania* spp., *Echinococcus granulosus* / *Echinococcus multilocularis*

HTLV (in aree localizzate dell'Iran), WNV, Virus della rabbia, **malaria** (in alcuni Paesi), leishmaniasi viscerale e cutanea, filariosi (Yemen), *Echinococcus granulosus*, *Schistosoma* spp. (in alcuni Paesi)

HTLV-1, WNV, virus della rabbia, *Penicillium marseffei*, **malaria** (in alcuni Paesi), leishmaniasi viscerale e cutanea, *Echinococcus granulosus* / *Echinococcus multilocularis*, *Schistosoma* spp., *Strongyloides* spp.

 North America  
 Central America and Mexico  
 Caribbean  
 South America

 North Africa  
 West Africa  
 South Africa

 Southeast Asia  
 Oceania



Virus della Rabbia, **malaria**, leishmaniosi viscerale e cutanea, filariosi linfatica, *Entamoeba histolytica*, *Taenia solium* (cisticercosi), *Echinococcus granulosus*, *Schistosoma* spp.

Virus della Rabbia, *Penicillium marneffei*, **malaria**, filariosi linfatica, *Entamoeba histolytica*, *Taenia solium* (cisticercosi), *Schistosoma* spp., *Strongyloides* spp.

HTLV-1, **malaria** (in alcuni Paesi), filariosi linfatica, *Entamoeba histolytica*, *Strongyloides* spp., *Echinococcus granulosus*

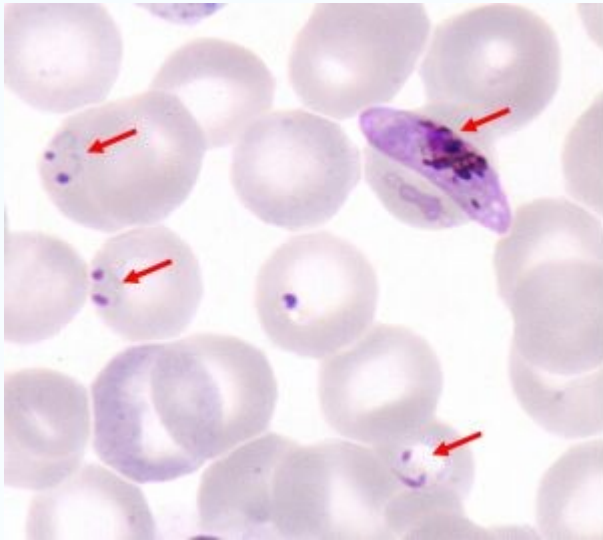
 North America  
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 North  
 West, Central and South America  
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 Southeast Asia  
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# Malaria

- Screening del donatore raccomandato se:
  - Immigranti, Rifugiati, Viaggiatori
  - Nei 3 anni precedenti presenza in aree di endemia

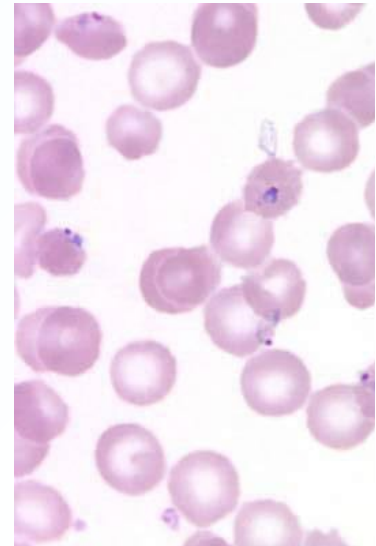


# Malaria

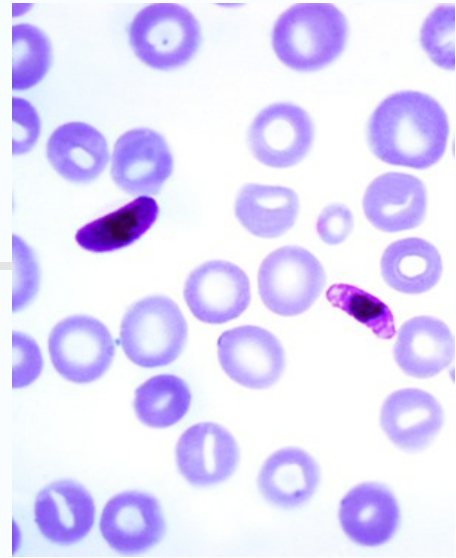
## American Association of Blood Banks - USA

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- Deferral for 3 years
  - Departure from a malarial country of birth
  - Departure from a malarial country of residency
- Deferral for 12 months after departure
  - From Iraq
  - From recent travel to a malarial area



# Malaria



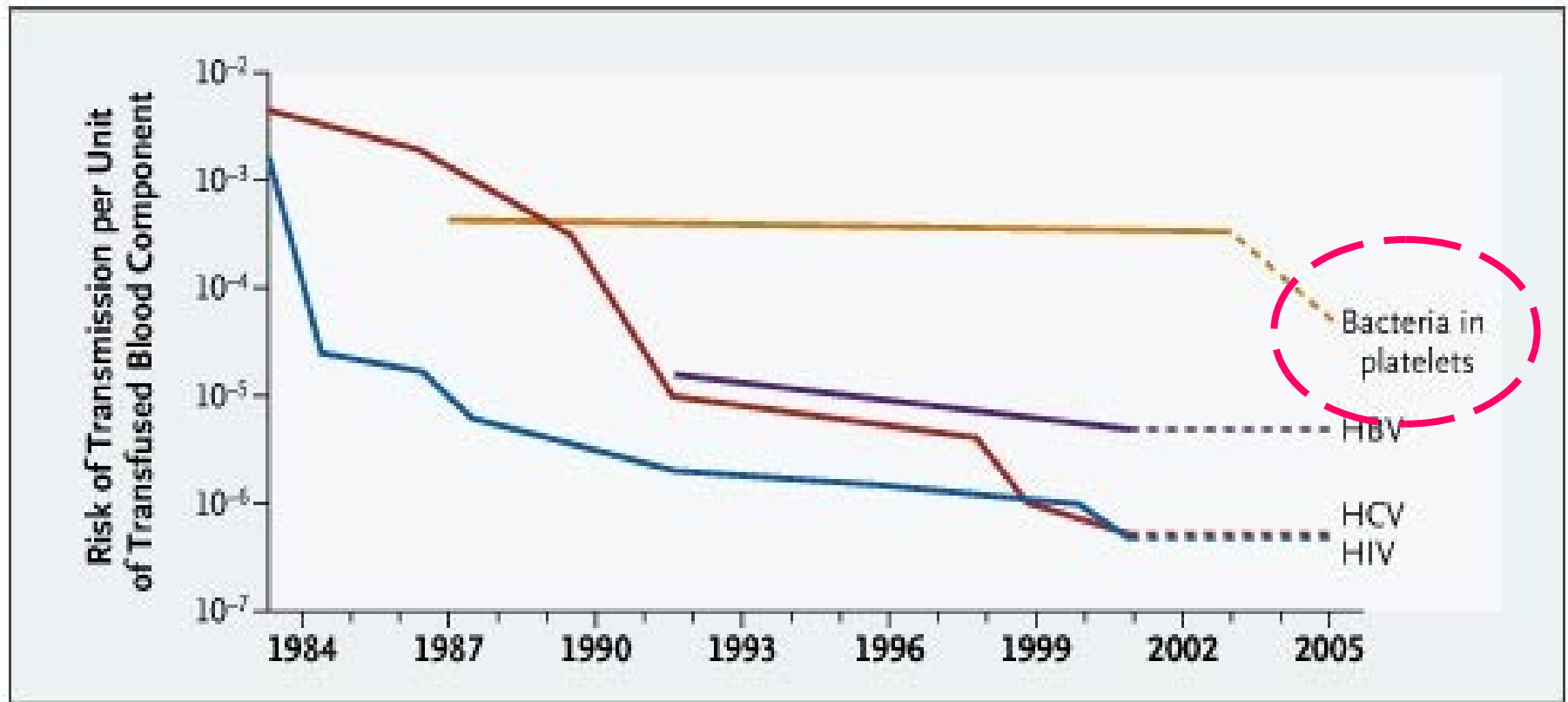
- Sierologia
  - Utile per individuare soggetti esposti
  - Non utile per la diagnosi di infezione in atto
- Esame microscopico
  - Striscio e goccia spessa
  - Sensibile (...). Non applicabile per screening di donatori
- Test Immunocromatografici (antigene HRP2)
  - Falsi negativi se parassitemia
    - $< 300 / \mu\text{L}$  oppure  $> 18.000 / \mu\text{L}$
- Test molecolari
  - Sensibili e specifici
  - Soglia di individuazione ancora insufficiente per le basse parassitemie

# Malaria e Donatori di sangue

- Test diagnostici
  - Poco utili
- **Questionario**
  - Imprescindibile
- Test di screening
  - Sierologia
    - IFAT
    - EIA



# Risks of Transfusion-Transmitted HIV, HBV, HCV, and Bacterial Infection in the United States, 1984–2005



# Why Are we Speaking About Bacteria in Blood Products?

## ARC Website



*Figure 1.*

*An extreme example of the appearance of platelets heavily contaminated with E. coli upon gross visual examination is shown above. This unit of single donor platelets was collected from a woman who had a urinary tract infection prior to donation which was partially treated with antibiotics. She was asymptomatic at donation. The clumps shown above were found by blood center staff while they were conducting routine visual examination of the platelet donation. This platelet donation was not released from the blood center. Follow-up investigation and cultures showed that both the platelets and donor's urine grew E. coli. This particular case is a good example of how bacterial contamination of blood components can result from a donor with an asymptomatic infection and occult bacteremia.*

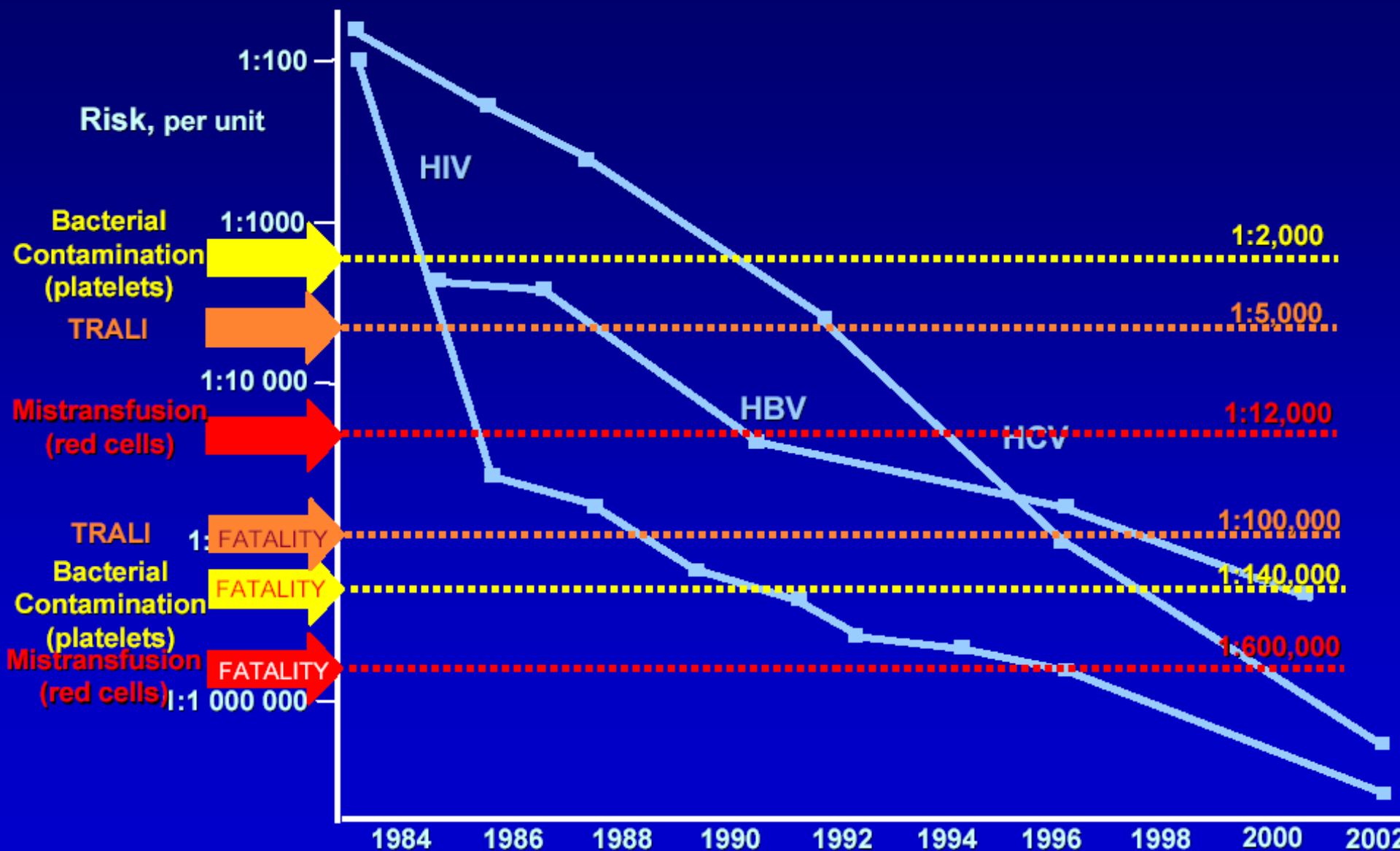
## NBS Website



**17 Platelet Related Septic Deaths Reported to FDA in 2002  
Estimated 67 – 333 Deaths per Year in the US**



# The Evolution of Transfusion Risks



Updated from: Goodnough LT *et al.* *NEJM* 1999;341:126-7



# A prospective study of symptomatic bacteremia following platelet transfusion

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- 161 bone marrow transplant recipients in Hong Kong
- 1 in 2,000 units of platelet concentrates bacterially contaminated
- (1 in 350 pooled platelets contaminated)
- Among patients who were febrile (elevation of temperature of  $\geq 1^{\circ}\text{C}$ ) following platelet transfusion, 1 in 4 (27%) had received a bacterially contaminated unit.
- Of those found to have a  $\geq 2^{\circ}\text{C}$  rise in temperature following a platelet transfusion, 50% had received a bacterially contaminated unit.
- In this multiply transfused patient population, the chance of receiving a bacterially contaminated platelet was 1 in 16.
- Of the 10 patients known to have received a bacterially contaminated unit, 4 suffered from septic shock.

# Il Donatore "sano"

Vox Sanguinis (2004) 87, 299–301

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## CASE REPORT

### Positive BacT/ALERT signal from a platelet concentrate 23 h before the donor was admitted to hospital with *Streptococcus pneumoniae* septicaemia

C. P. Larsen,<sup>1</sup> N. O. Hermansen,<sup>2</sup> T. Dahl<sup>3</sup> & J. Kjeldsen-Kragh<sup>1</sup>

<sup>1</sup>Department of Immunology and Transfusion Medicine, Ullevål University Hospital, Oslo, Norway

<sup>2</sup>Department of Microbiology, Ullevål University Hospital, Oslo, Norway

<sup>3</sup>Department of Internal Medicine, Aker University Hospital, Oslo, Norway

### Initial Results of Culturing Apheresis Platelets to Detect Bacterial Contamination

#### The First 6 Months' Experience at the American Red Cross

Linda A. Chambers, MD  
Senior Medical Officer, Biomedical Headquarters  
Washington, DC

AABB, Baltimore; October 2004

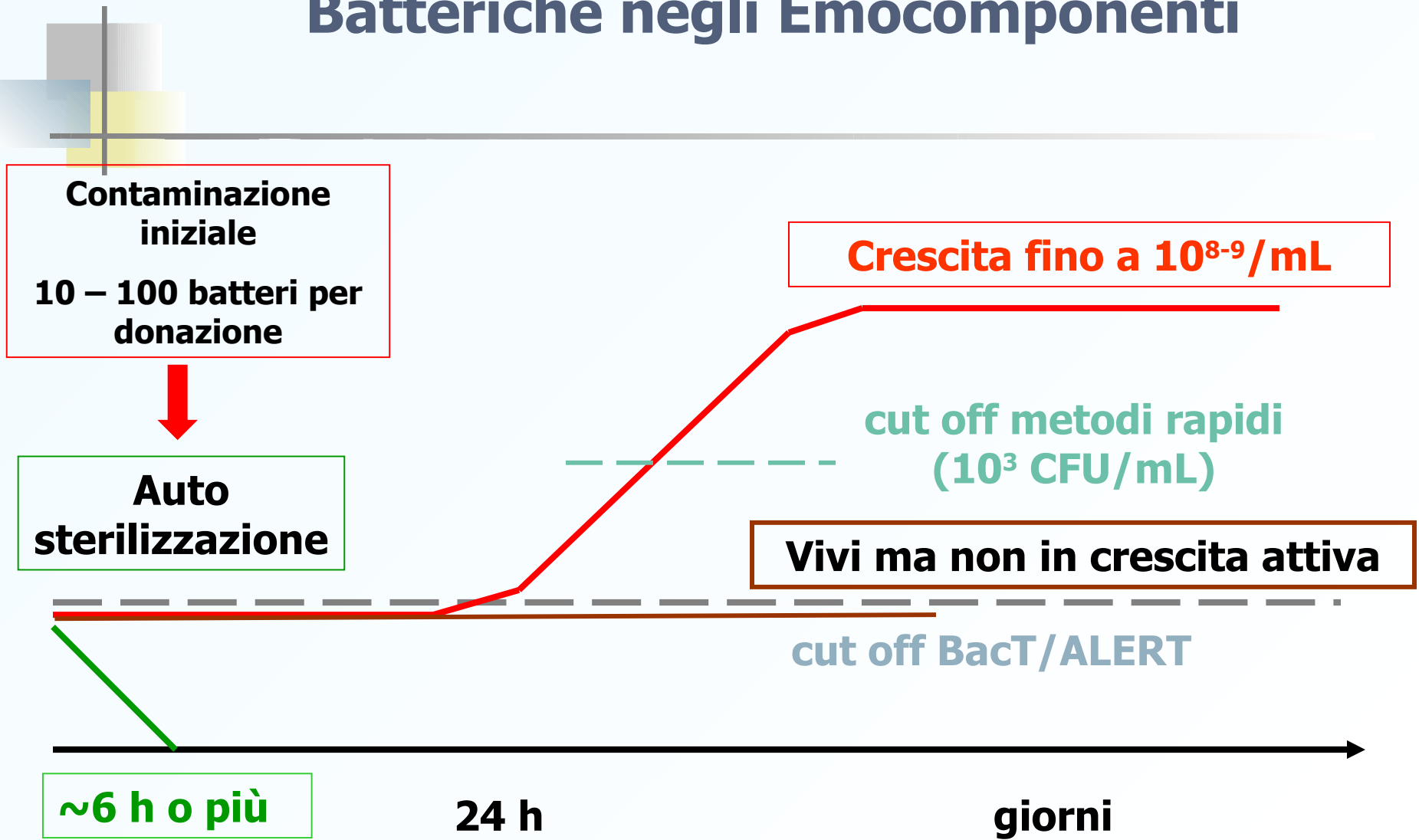
- Donor who was working with a horse with an infected leg; donation contained Group G Streptococcus
- Donor with *Streptococcus bovis* contaminated donation
  - Referred for GI evaluation
  - Carcinoma discovered



# Case: Donor health

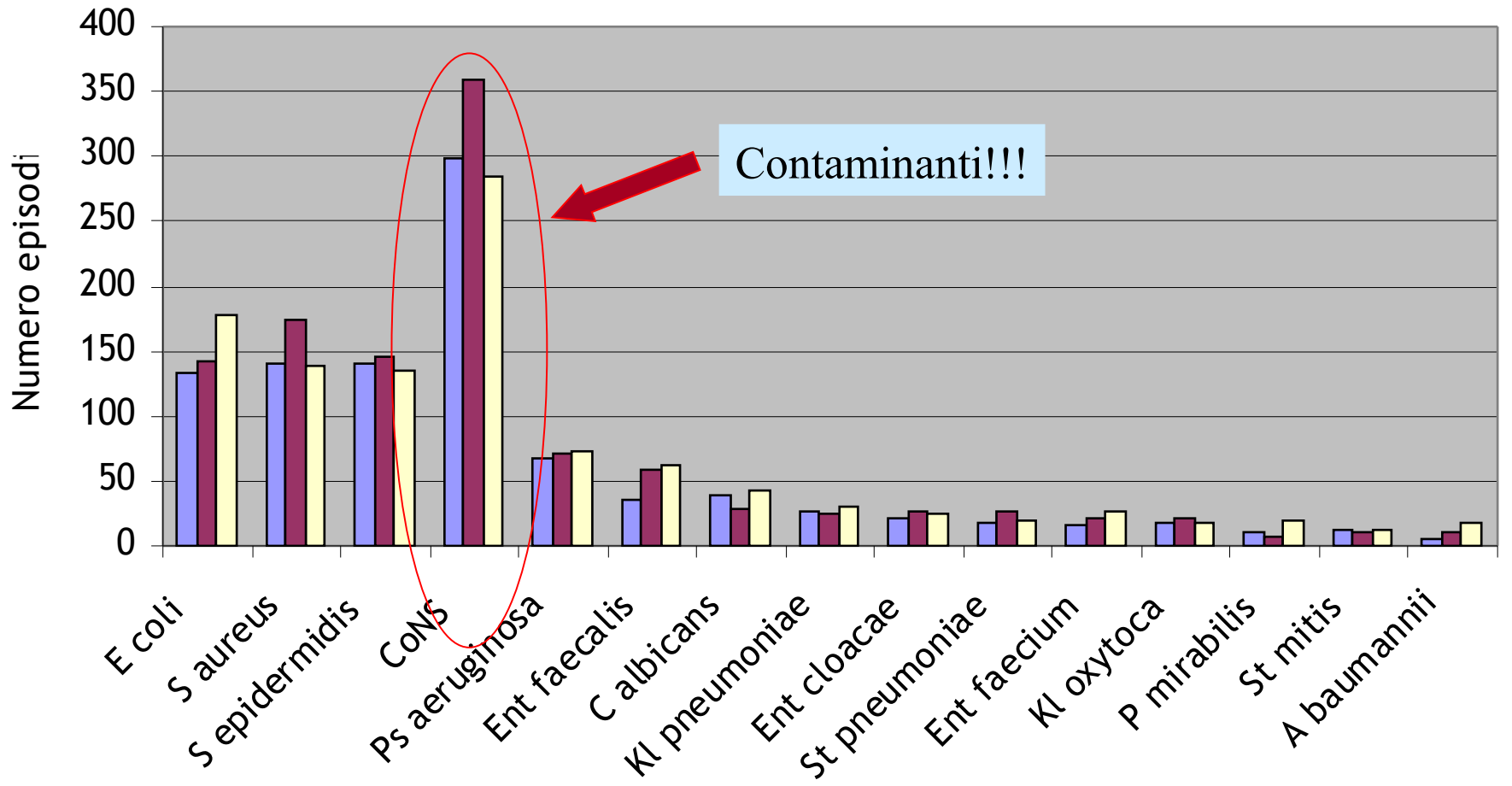
- Patient received platelets and subsequently developed a blood stream infection with *Streptococcus agalactiae* (group B streptococcus)-unit found to be contaminated.
- Bacteremia with this organism has been associated with colon cancer.

# Comportamento di differenti Specie Batteriche negli Emocomponenti



# Emocolture - Niguarda

2003 2004 2005





# Disinfezione della Cute

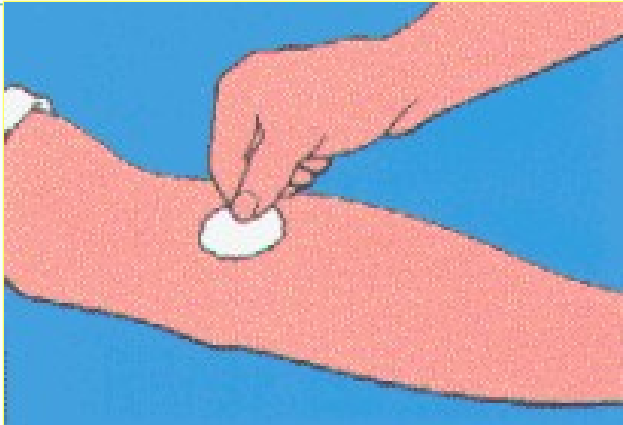
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- Sono superiori a Iodio-Povidone
  - Tintura di Iodio
  - Perossido di Cloro
  - Clorexidina Gluconato
- Sono equivalenti tra loro
  - Tintura di Iodio
  - Clorexidina Gluconato

# Disinfezione della Cute

- Uso corretto degli antisettici
  - Iodio-Povidone 10% → 1.5 - 2 minuti
  - Tintura di Iodio 2% → 30 secondi
  - Clorexidina alcoolica 0.5% → 20-30 secondi

**L'azione dei disinfettanti è Tempo-Dipendente**





# Bacterial contamination of blood components due to *Burkholderia cepacia* contamination from chlorhexidine bottles

Table 1 Details of infected patients

Sex	Age	Disease	Symptoms	Immunological study	Blood Culture	
					Blood unit	Patient
Male	68	Rectum cancer	Fever, chills, shock, tachycardia	Negative	Positive	Positive
Male	28	Acute lymphoblastic leukaemia	Fever, tachycardia	Not done	Not done	Positive
Female	59	Gastric bleeding	Fever, chills, tachycardia, shock	Negative	Not done	Positive



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# ***CORRIERE DELLA SERA***

**BRESCIA . GIA' PRIMA DEI DECESSI, AVVENUTI IN OSPEDALE NEL ' 95,  
ERANO SORTI SOSPETTI SULLE FLEBO CONTAMINATE**

## **Sangue killer, tardi l' allarme**

*Quei tre pazienti non " dovevano " morire*



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# ***CORRIERE DELLA SERA***

**DOPO LE VITTIME DI IERI UN ALTRO PAZIENTE POTREBBE ESSERE DECEDUTO PER SETTICEMIA. DUE MALATI SONO ANCORA GRAVI.**

## **Trasfusioni, l' incubo del terzo morto**

*Il procuratore: anche se c'e' stata disattenzione scatteranno le manette.*

*I Nas sequestrano a Brescia 1500 sacche che sono state importate dal Giappone.*

*Il professor Aiuti: " Ancora malasanita' "*



# Il vecchio... inatteso

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## ***CORRIERE DELLA SERA***

**LO CONFERMEREBBE UNA PERIZIA DEPOSITATA DALL' AZIENDA  
GIAPPONESE CHE PRODUCE LE SACCHE " INCRIMINATE "**

### **Sangue killer, colpa del disinfettante**

*Tre pazienti sottoposti a trasfusione morirono all' ospedale di Brescia*

# Il Miracolo di Bolsena

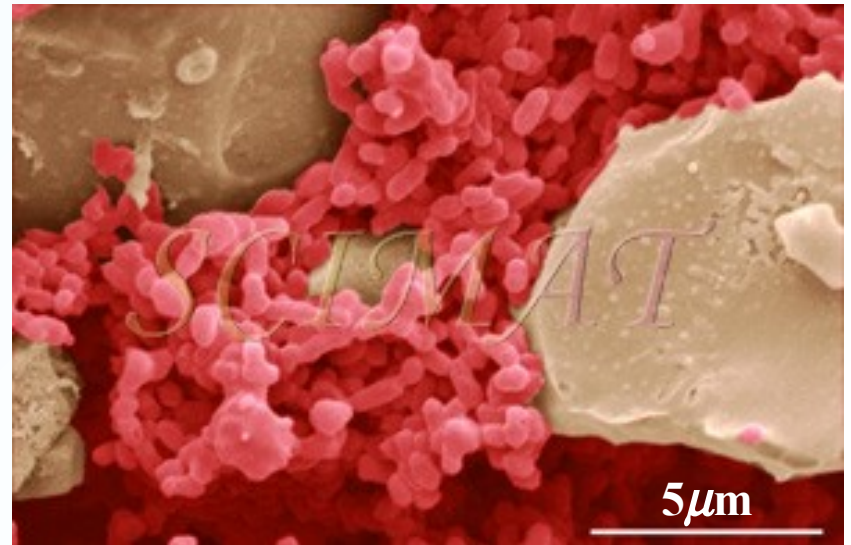


Pietro di Praga nella Chiesa di Santa Cristina a Bolsena nel 1263

- Il pigmento rosso di *Serratia* sul pane fu interpretato come il sangue di Cristo



Raffaello Sanzio (1483-1520), Vaticano



# *Serratia* species

- Bacillo Gram-negativo
- 7 specie
  - *S. marcescens* la più comune
- Mobile, pigmento rosso
- Ambientale
  - acqua, terreno, piante, insetti, animali
- Enzimi extracellulari contribuiscono alla patogenicità
  - elastasi, lecitinasi, caseinasi, etc.
- Può essere multi-resistente agli antibiotici





# Epidemie da *Serratia marcescens*

## Fonti implicate in letteratura

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- Teofillina liquida
- Latte da biberon usati
- Sistemi di ventilazione
- Tiralatte
- Additivi per nutrizione enterale
- Detergenti cutanei
- Saponi antisettici
- Tubi da aspirazione
- **Disinfettanti**







**Grazie per l'attenzione**