AGENCE FRANÇAISE DE SECURITE SANITAIRE DES PRODUITS DE SANTE

2001 Annual Report
Haemovigilance Unit

National Data

2001 Annual Report

H a e m o v i g i l a n c e

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This work could be achieved thanks to the collaboration of

Haemovigilance Correspondents at Health Care Centers,
Haemovigilance Correspondents at Blood Transfusion Centers,
for collecting and transmitting the data,

Regional Haemovigilance Coordinators for their regional survey syntheses and investigations,

the Haemovigilance Department of the Etablissement Français du Sang,

M-Phuong VO MAI for preparingand analysing the data,

Nicole SIMON for the layout,

The whole team of the Haemovigilance Unit at the AFSSAPS,
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FOREWORD:

Enforced in 1994, haemovigilance contributes to the quality of the whole transfusion system, and goes far beyond the simple fact of collecting and interpreting transfusion incidents. In fact, it applies to the whole transfusion supervision and security system, lying on the compulsory report of incidents first, but also on the traceability of labile blood components and the follow-up of tranfused patients.

The objective of the present "2001 Report" is to provide health care professionals and the public with a homogeneous information on the haemovigilance system in France. Such a procedure lies within a context of information exchange between the great many actors of the system, either at national, regional, local or even international levels.

Most of the European states are now in the process of or have been developping a haemovigilance system intended to discard a certain number of risks related to transfusion. France is known for the efficacy of its experience, which is the oldest in Europe and probably in the world too, and wishes to make its contribution to the development of references in the field of haemovigilance.

2. INTRODUCTION: INSTITUTIONAL AND ORGANIZATIONAL CONTEXT OF TRANSFUSION

2.1. Legal Aspects

Regulation no. 93-5 dated January 4, 1993 modified by Regulation no. 98-535 dated July 1st, 1998.

Haemovigilance is defined in Regulation no. 93-5 of January 4, 1993. It is "a series of supervision procedures organized from blood collection, including components, to the recipient follow-up, so as to collect and evaluate the information on unexpected or adverse events resulting from the therapeutic use of labile blood components (BC) and to prevent their occurrence ». (Art. L.1221-13)

"Haemovigilance is an element of transfusion security. It implies for all prepared labile blood unit:
* the statement of any unexpected or adverse event associated with or likely to be associated with the therapeutic use of the product;
* to collect, keep and give easy access to information relating to the blood product collection, preparation and use as well as to information relating to the above mentioned events;
* the evaluation and use of such information in order to prevent any unexpected or adverse event from happening, related to the therapeutic use of these labile blood products."(Art. R. 666-12-1)

Regulation no. 98-535 dated July 1st, 1998 modifies Regulation no. 93-5 dated January 4, 1993 and reinforces the public health surveillance and health security control of blood products for use in human. Such regulation, along with Decree no. 94-68 dated January 24, 1994, modified by Decree no. 99-150 dated March 4, 1999, transfers the management of haemovigilance from the AFS to the Afssaps. The latter now defines the orientations of haemovigilance and leads the actors of the network. Furthermore, since March 1999, it centralises and manages the data gathered on the Haemovigilance network, the structure of which is still based on the same principal of direct collaboration between Health Care Centers and Blood Transfusion Centers for epidemiology and prevention purposes.

2.2. Organizational Aspects: Three major aspects of haemovigilance

Reference: Administrative circular DGS/DH no.40 dated July 7, 1994 (relative to the decree of January 24, 1994) modified by Administrative circular DGS/DH no.99-424 dated July 19, 1999: concerning haemovigilance actors and their role, the compulsory report of tranfusion incidents, and traceability.

2.2.1. Compulsory notification of transfusion incidents

- Standardized notification form: paper copy of the alert notification - 1994 Directive no.1, co-signed by the Health Care Center and Blood Transfusion Centers (BTC) correspondents, transmitted to the regional and national levels

- National computerized database, GIFIT (1996) - Decision DG no. 2001-50 of May 7, 2001, relative to the documentation of tranfusion incident report forms, enforced by the Agence française de sécurité sanitaire des produits de santé

2.2.2. Compulsory traceability

- From the donor to the recipient, from the BTC to the Health Care Center and information feedback to the BTC after transfusion, in the form of paper copy: Administrative circular DGS/DH

no. 92 dated December 30, 1994, and Technical Directive no.2 dated November 8, 1994, of the AFS.

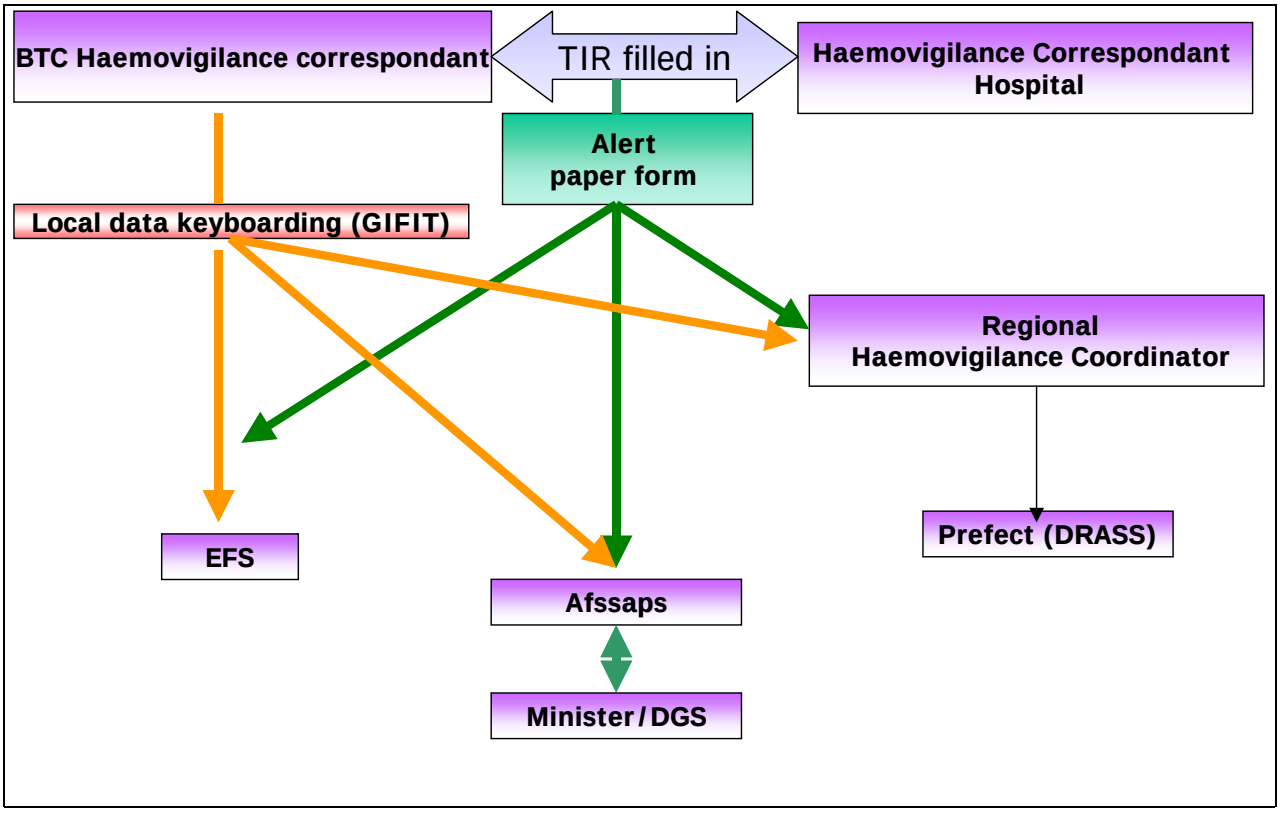
- Computerized form: regional traceability computerization projects: Administrative circular DGS/DH/AFS no.97/816 dated December 24, 1997, and Directive no.2 bis dated November 24, 1997, of the AFS.

- Decision of the General Manager of the Agence française de sécurité sanitaire des produits de santé in date of March 28, 2001, carrying modifications to several appendices of Technical Directive no. 2 bis of the Agence française du sang (Administrative circular DGS/DH no. 97-816 dated November 24, 1997) concerning the implementation conditions of the labile blood components traceability computerization.

2.2.3. Haemovigilance network: more than 2,200 actors

2.2.3.1. Three level network

A three level network: local, regional, and national



2.2.3.2. Local network

Set up in 1994 by the Agence Française du Sang, the haemovigilance network now has close to 2200 Haemovigilance Correspondents (Health Care Centers and Blood Transfusion Centers).

HCC local level

- Each of the 2000 private, military and public health care centers shall appoint one haemovigilance correspondent (doctor or pharmacist). His/her identity is transmitted to the RHC, the BTC and the Afssaps.
- Each HCC is attached to a blood transfusion center which is its unique distributor.
- A Haemovigilance and Transfusion Security Comity (CSTH) is appointed for public health care centers.
- Blood storage in health care centers is authorized following decision of the prefect in each department of France (Administrative circular DGS/DH no.2000/246 dated May 4, 2000). Agreement signed between the hospital and the BTC – More than 700 storage sites are identified.

BTC local level

- One haemovigilance correspondent in each blood transfusion center, appointed by the President of the Etablissement français du sang (doctor or pharmacist). His/her identity is transmitted to the RHC and the Afssaps. 18 BTC correspondents were appointed.
- Each distribution site (about 120 sites) has a deputy correspondant.

2.2.3.3. Regional network

- A regional haemovigilance coordinator (RHC) is a doctor appointed in each sanitary region next to the DRASS (Directeur Régional des Affaires Sanitaires et Sociales, Regional Director for Health and Social Affairs) by the prefect for three years, after positive advice of the Afssaps. 27 regional haemovigilance coordinators were appointed.

- Regional meetings with the personnel of health care and blood transfusion centers are organized two to three times a year.
- A training support and coordination are organized (development of procedures).
- Technical and organizational meetings, specific collaboration with the state decentralized services (Public Health inspectors) and the Afssaps services are there for blood storage instructions among other things: 230 instructions in 18 months.

2.2.3.4. National network

* Haemovigilance Unit (Afssaps).
* Haemovigilance Department (EFS- head office)
* The Société Française de Vigilance et Thérapeutique Transfusionnelle
* Specific annual meetings

2.3. Transfusion figures for 2001

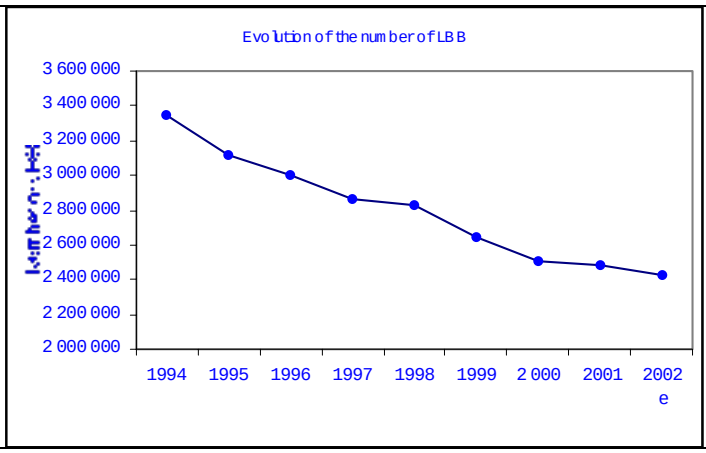
2.3.1. Number of blood components distributed in 2001 and evolution

Number of blood collections and blood products transferred in 2001

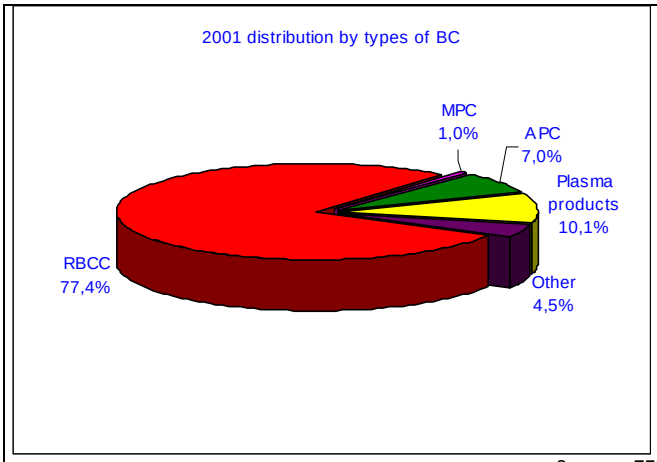
Blood collections	2 506 541
Distributed BC	2 380 526

Source EFS

The global evolution of transferred BC shows a regular regression of 3 to 5 % per year, without distinction of product. The estimate for 2002 is a mathematical calculation. The observation of the first nine months of year 2002 could lead to scale up this estimate.



2.3.2. Types of products distributed in 2001

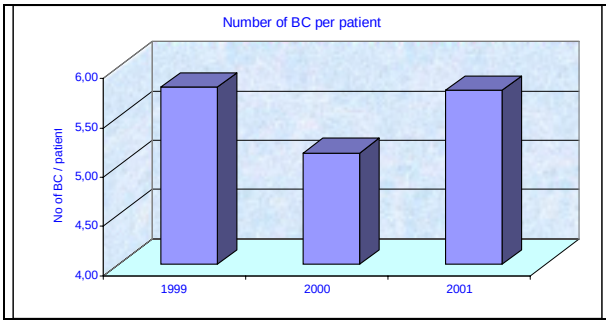


Source EFS

The product type distribution has been stable with a fresh plasma /red blood cell concentrate ratio in the order of 1/9. Considering the average number (5) of standard platelet concentrates in a platelet pool, apheresis platelet concentrates appear to be approximately seven times more used than standard platelet pools (MPC).

2.3.3. Patient data

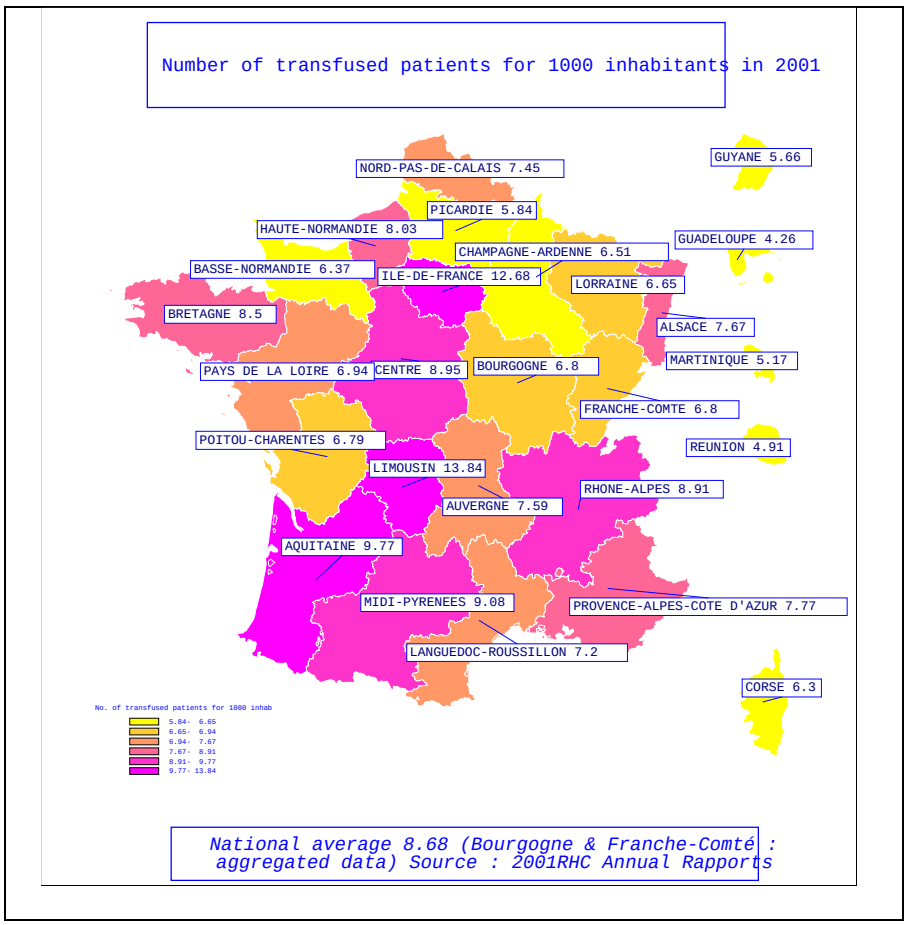
2.3.3.1. Number of transfused products per patient in 1999-2001



The number of transfused products per patient appears to be quite difficult to obtain and to evaluate, as well as the total number of transfused patients. The latter figure, estimated on the basis of the data gathered from the 2000 health care centers by RHC in the year 2001 is approximately 450 000 patients.

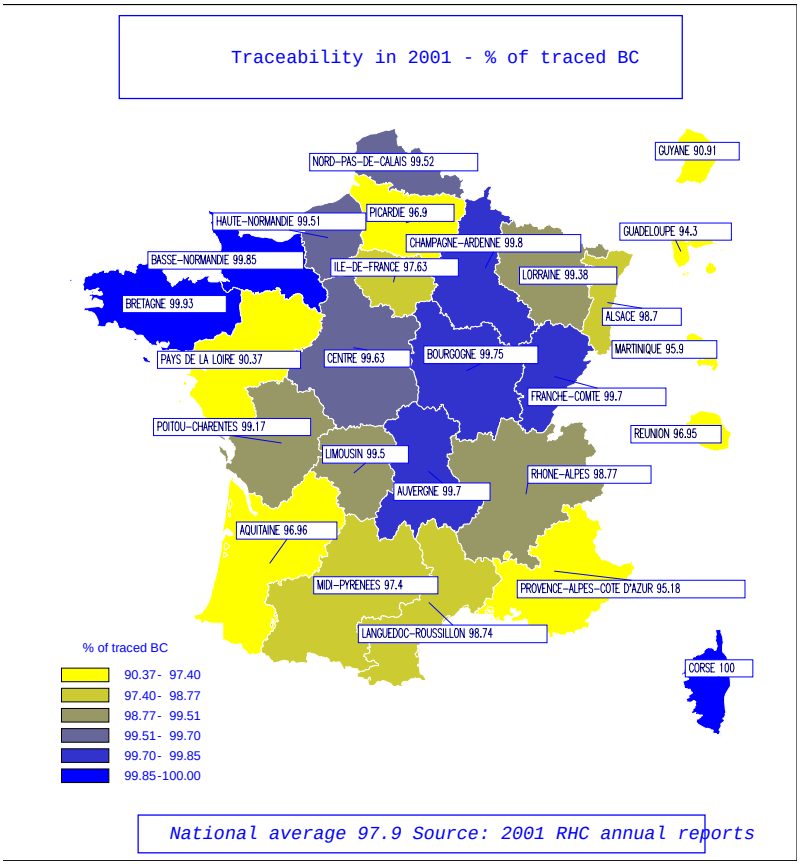
Source 2001 RHC annual report

2.3.3.2. Number of transfused patients for 1000 inhabitants in 2001



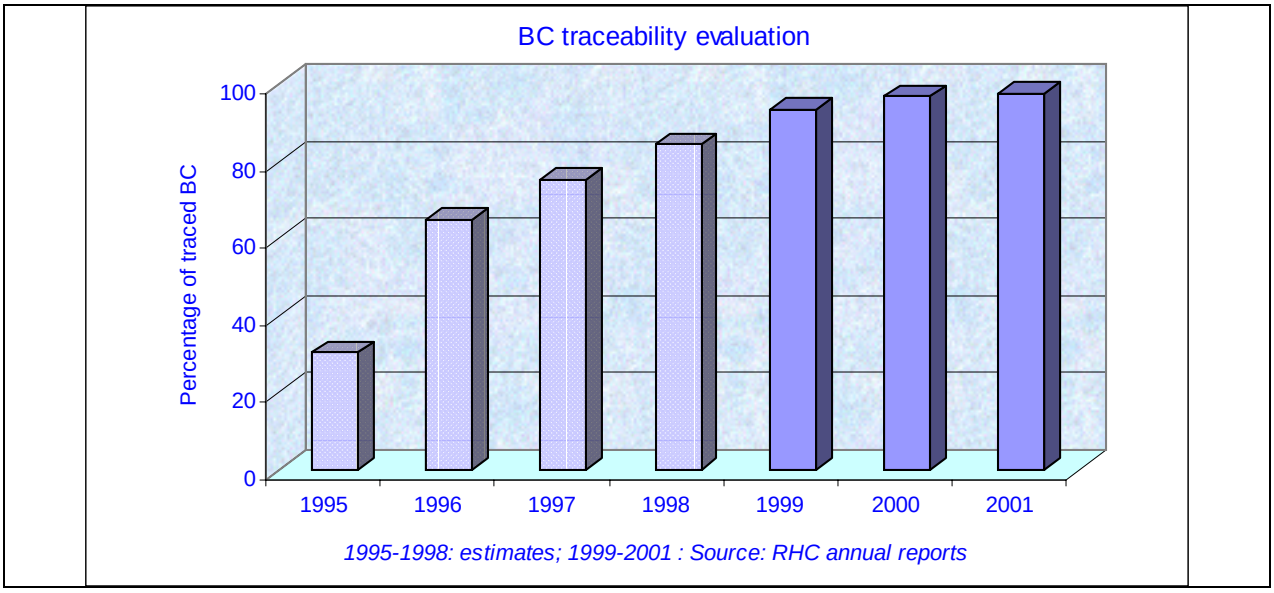
Source 2001 RHC annual report

2.3.4. Traceability of distributed product by regions in 2001



Source 2001 RHC annual report

The national average traceability of labile blood components in France emerges at 97.9%, i.e. a constant progression with a good reliability since the data was available. However, progression between years 2000 and 2001 was smaller and it seems very probable that the last two points will be the most difficult to win. Implementing traceability computerization projects should help to complete the progression.



3. HAEMOVIGILANCE CONTEXT IN 1995-2001

3.1. Main open or expected dossiers in 2001

3.1.1. Traceability computerization

Traceability shall record all participants and procedures involved in the chain of transfusion since the donor to the blood product recipient. The objective of traceability is to be able to identify from a donation number the donor and his/her donation background on the one hand, and the actual recipient(s) of the blood products derived from a donation on the other. It requires a close collaboration between HCC and BTC so that the information related to such traceability can be transmitted between the various centers upon order and distribution of the products, and information feedback after use of the products.

- The organization of the traceability information circuit is defined by Directive no.2 dated December 8, 1994, of the AFS which makes provision for a computerization of these data transfers.

- After an experimental phase and the preparation of standards with the AFNOR, a new Directive no.2bis dated November 24, 1997, of the AFS, defines the outlines of the regional traceability computerization projects supervised by the regional haemovigilance coordinators.

- The BC traceability computerization follow-up is now being performed by the Comité National d'Informatisation de la Traçabilité set up by Administrative circular DGS/DH/AFS no.97/816 dated December 24, 1997 , managed by the haemovigilance unit with the assistance of the Afssaps IT department. 13 regions out of 21 have a formal traceability computerization project and have alrealdy submitted a step report. Codification tables are being updated and standards application tools are being developped.

3.1.2. Revision of the directive concerning TI by bacterial contamination of BC

An update of Administrative circular DGS/DH/AFS no.85 dated October 10, 1995, concerning the course of action to adopt in case of bacterial incidents is being finalized. A better definition of the technical conditions of culture is given as well as a definition of the laboratories authorized to perform these tests.

A centralisation of the bacteriological strains involved in the incidents will soon be organized.

3.1.3. Validation of TI by bacterial contamination of BC

Analysis of the transmitted data on tranfusion incidents showed that about 0.6 % of the TI reported between 1999 and 2001, *without distinction of grades and imputabilities,* constitute suspicion cases of Transfusion Incidents by Bacteriological Contamination (TIBC). Among them, BC culture leads to the identification of a germ in about 50 cases per year.

- TI with identified positive culture and an imputability >=2 (investigation completed) represent less than 1 out of 100 000 BC distributed since 1999.

For 2 years, the "working group on validation of TIBC » has already worked on more than 170 transfusion incident report forms with identified positive culture from the GIFIT data base:

Reexamination of TI with positive culture per year of occurrence

	Other years	1999	2000	2001	June 2002	Total
GIFIT TIR	87	70	43	35	26	261
Examined TIR	5	1	9	29	16	60
Reevaluated TIR	0	1	9	24	16	50

Among these suspicion cases of TIBC, 60 were retained by the group of experts, 50 of which could be reevaluated with, for some, a request for more information or even a modification.

The Agence Française de Sécurité Sanitaire des Produits de Santé has planed to issue an invitation to tender (in 2003) for a research project on transfusion incidents by bacterial contamination of labile blood products.

3.1.4. "TRALI" diagnosis category

Transfusion Related Acute Lung injury (TRALI) is a rare but sometimes fatal transfusion complication. To date, the national haemovigilance network has identified 11 cases of suspicion of TRALI. Compared to the North American data, incident reports are few in France. This might be explained by the fact that some incidents might have not been explicitly reported in the GIFIT data base since 1994. In fact, until very recently, the "TRALI" diagnosis category was not clearly individualized on the Tranfusion Incident Report Form.

In the United States, since 1992, the FDA has reported a high number of fatal cases of TRALI (more than 45 notified cases), which represented, in terms of frequency, the 3rd cause of death related to transfusion in the year 2000. For most deaths, fresh frozen plasma had been transfused. Furthermore, American authorities point out that, although there are probably undiagnosed TRALI cases and/or significant underreporting, spontanous notifications of non fatal TRALI cases also seem to be increasing, (26 cases reported since 1999). Moreover, it is also necessary to mention that all BC as well as some blood-derived medicinal products may be concerned by TRALI occuring. It is principally fresh frozen plasma but also platelet concentrates, whole blood, red blood cell concentrates, cryoprecipitates and exceptionally polyvalent intravenous human immunoglobulins.

3.1.5. New project of "e-fit" centralised database

Set up by the AFS in 1996, the computerized management of transfusion incident report forms (GIFIT) has reached a critical level, as much in size as in technological validity. Thus, the Agence decided to operate a deep reform. It is a complete restructuration focusing on both a new definition of the database and a new report electronic transmission system, using the existing social health network. The report electronic transmission system will be accessible to all the haemovigilance network actors, including health care center haemovigilance correspondents. An invitation to tender was issued in the BOAMP and the offers are now being studied. Such a project –"e-fit" - will require considerable implementation investments in 2003, particularly for data retrieval and transfer to the new data base and yearbook publishing.

3.1.6. Haemovigilance relative to donations and donors

The definition of haemovigilance includes supervising the events occuring in the whole transfusion chain, from the donor to the recipients. The supervision of events relative and subsequent to donations hadn't been any particularly further processed until now, and haemovigilance relative to donations and donors (post-donation information and traceability inquiry follow-up) has

become necessary. Works are being undertaken with the partners concerned, especially on the notification form, the future database and processing and management procedures. Voluntary reporting procedures are being tested and analysed.

3.1.7. Others projects and works

. Working groups with the network actors (BTC, HCC et RHC): ABO accidents, volume overload blood, TRALI

. Working groups with the regional haemovigilance coordinators: national follow-up of pre- and post-transfusion examinations, TAPO

. BC transport and distribution conditions in collaboration with the Agence "Inspection" unit.

3.2. Progress of haemovigilance in 1995-2001

Collecting haemovigilance data contributed to centralise information relative to transfusion incidents in the first place, then to examine and analyse it, better evaluate frequencies and incidences, and identify their causes.

3.2.1. Centralisation of the information on transfusion incidents

3.2.1.1. Alert TIR

Alert reports through the fax or post within the provided time limit of 48 hours for the following events:

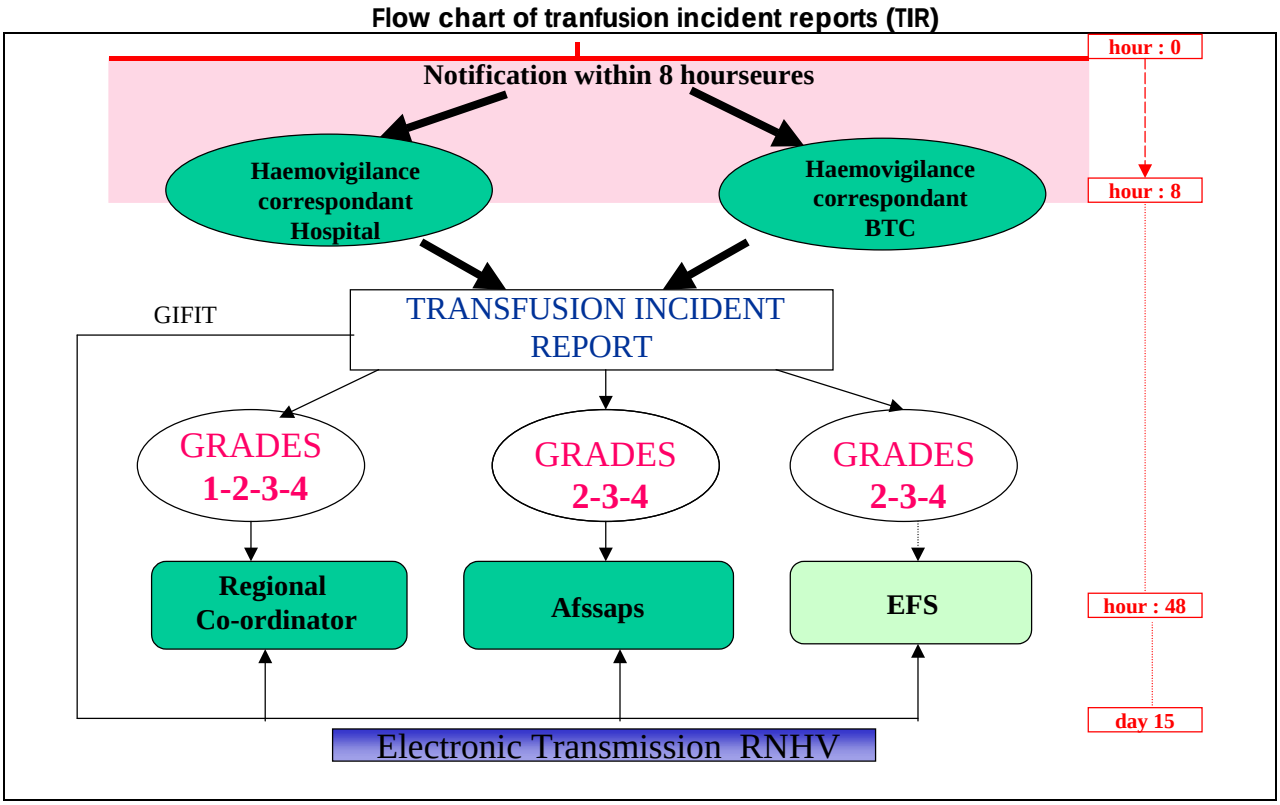
1. incidents with a gravity equivalent or superior to 2 (except Post-transfusion irregular anti-erythrocyte antibody identifications or IAEAb since 2001)
2. suspected or known bacterial incidents, however serious they are
3. incidents possibly involving other recipients (ex: ABO incident, viral seroconversion)
4. incident in relation to defective material (materiovigilance)
5. incidents related to a BTC or HCC dysfunction possibly jeopardizing transfusion security.

The concerned TIR shall be addressed by the BTC or HCC haemovigilance correspondents to the following recipients: Afssaps, EFS-head office, regional haemovigilance coordinators (RHC).

3.2.1.2. Electronic TIR

Then, the notifications are entered in the GIFIT software by the haemovigilance correspondents at Blood Transfusion Centers. *According to an investigation concerning data exhaustiveness conducted in December 2001, the Afssaps national database had incorporated 97.15% of the TIR existing in the BTC local databases.*

3.2.1.3. Flow chart of transfusion incident report forms



3.2.2. Transfusion incident follow-up and analysis

The follow-up and examination of TIR is done by evaluation doctors of the haemovigilance unit on a daily basis, which makes the particularity of the French system and allows quasi-immediate reactivity on incidents requiring further control or inquiry (e.g. about incriminated BC, donors – ascending inquiries). Regarding descending inquiries which are opened when abnormalities are observed a posteriori in donors, the network organization enables an intervention and close relationship between the various actors.

Moreover, protective measures and the BC stoppage are immediately implemented by blood tranfusion centers as soon as an incident is reported, when the quality and security of the BC are suspected, in order to identify and quarantine any other existing BC corresponding to the same donor. All these protective measures are used by the EFS, either upon request of the Afssaps or in close collaboration with it.

3.2.3. Concrete measures

The work done by the expert groups, with specific "ad hoc" mandates, contributed to better define and evaluate the major transfusion risks. They particularly helped to develop procedures and recommendations among other things:

3.2.3.1.Investigation and preventive actions:

3.2.3.1.1.Centralisation of the bacterial strains

Centralisation of the bacterial strains involved in transfusion incidents by bacterial contamination of BC will be organized at the Afssaps, and will be used to compare the strains isolated both on the patient and the BC, as well as for detailled epidemiological studies.

3.2.3.1.2. Inquiry form on transfusion incidents by bacterial contamination of BC

Specific inquiry, using an appropriate form, is made and followed by the RHC every time the presence of a germ is detected in the BC culture.

3.2.3.1.3. ABO type immunologic incidents

In the same way, each transfusion incident in relation to an ABO blood typing or identification error is subjected to an investigation and specific follow-up by the RHC. New recommendations concerning the use of final control devices at the patient bed, resulting from studies conducted on such incidents, are being finalized.

It was reminded that it is required to report any ABO incident, including mild incidents or those which did not cause clinical or biological reactions in the recipient. In fact, they are likely to have different consequences in other recipients and, their epidemiological study along with the other incidents should contribute to better understand their exact causes and to develop prevention.

3.2.3.2. Recommendations concerning TRALI

The Afssaps informed haemovigilance correspondents at health care centers and blood transfusion centers and RHC with the following measures to take in case of suspicion of TRALI.

Any suspicion of TRALI should be subjected to,
- when possible, a donor/recipient immunologic exploration in order to issue an objective transfusion imputability profile for the symptomatology;
- a transfusion incident report pursuant to article R.666-12-24 of the Public Health Code.

Clinical diagnosis of TRALI lies on a clinical symptomatology occurring generally between 1 and 2 hours after transfusion, including dyspnea, hypoxemia, hypotension and fever (with no sign of heart failure) associated with radiological signs of lung injury (bilateral interstitial syndrome). The biological confirmation of TRALI shall be sought in the form of antigranulocyte antibodies (PNA ...) or class I or II anti-HLA in the donor or the recipient.

3.2.3.3. Improvement of the incident report form support

New possibilities are incorporated in the TIR:

- Grade 0 (dysfunction without clinical or biological reaction) is introduced.

- The future TIR (e-fit) will make it possible to identify assignment errors

Update of Directive no.1 concerning the TIR transmission content and conditions (in preparation).

Complementary TIBC and ABO cards are being supplied to RHC. These complementary information report cards are tools which contribute to a finer analysis of incidents. A computerized version of these documents is being prepared.

3.3. Epidemiological data in 1995-2001

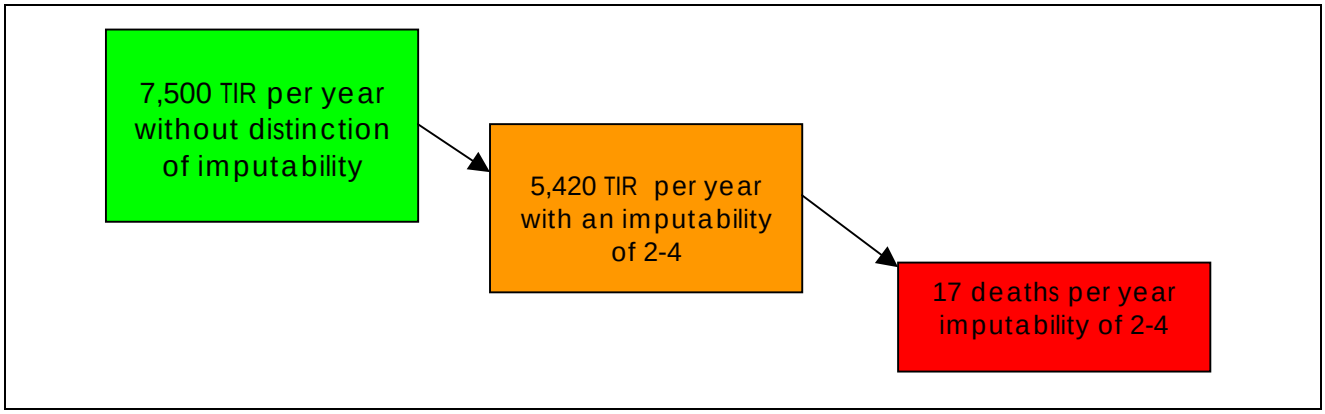
Warning:

1. The data are transmitted by haemovigilance correspondents and shall be corrected or completed by themselves only;
2. They concern all TIR, without distinction of imputabilities, including null and uncertain imputabilities after investigations;
3. *Some report forms are old and incomplete, particularly between 1995 and 1997, and could not be corrected. The data relative to these years shall be analysed with care.*

3.3.1. About 7,500 notifications per year

7,500 TIR per year (in 1996-2001 – the year 1995 was excluded because the data were not exhaustive – beginning of implementation of the haemovigilance system), 22 % of which are not imputable to transfusion, hence 5,420 TIR per year with an imputability of 2-4, and about 17 deaths per year with an imputability of 2-4.

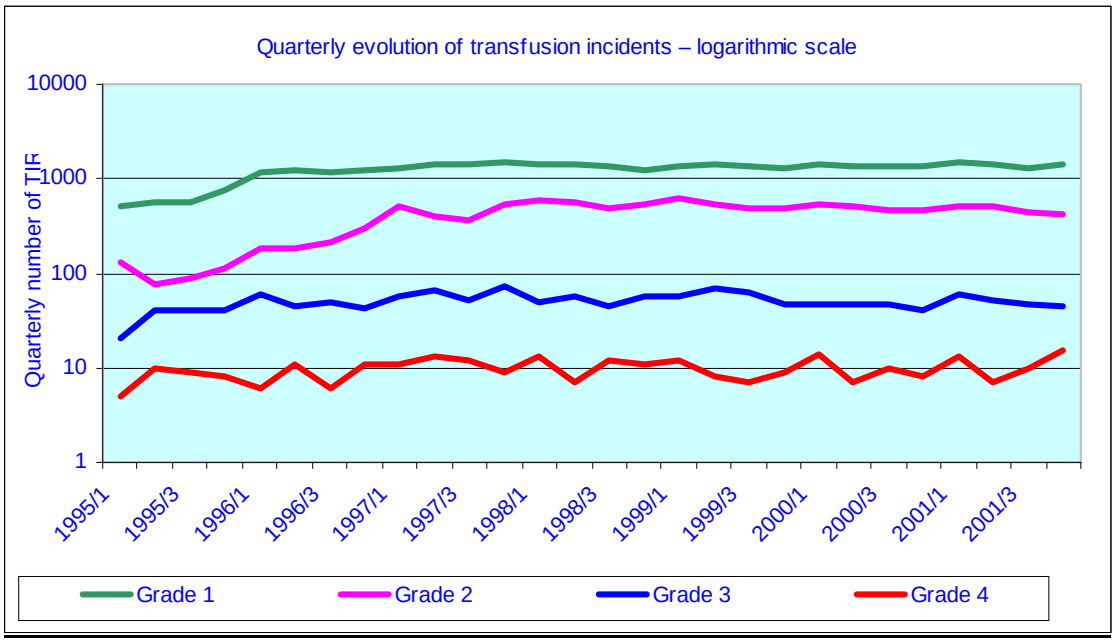
Number of transfusion incidents reported per year: 1996-2001



Legend:
Grade: 1: absence of life-threatening reaction; 2: long-term morbidity; 3: immediate life-threatening reaction; 4: death.
Imputability: 0 - excluded; 1 -uncertain; 2 - possible; 3 -probable; 4 - certain.

3.3.1.1. Quarterly evolution of the incident number

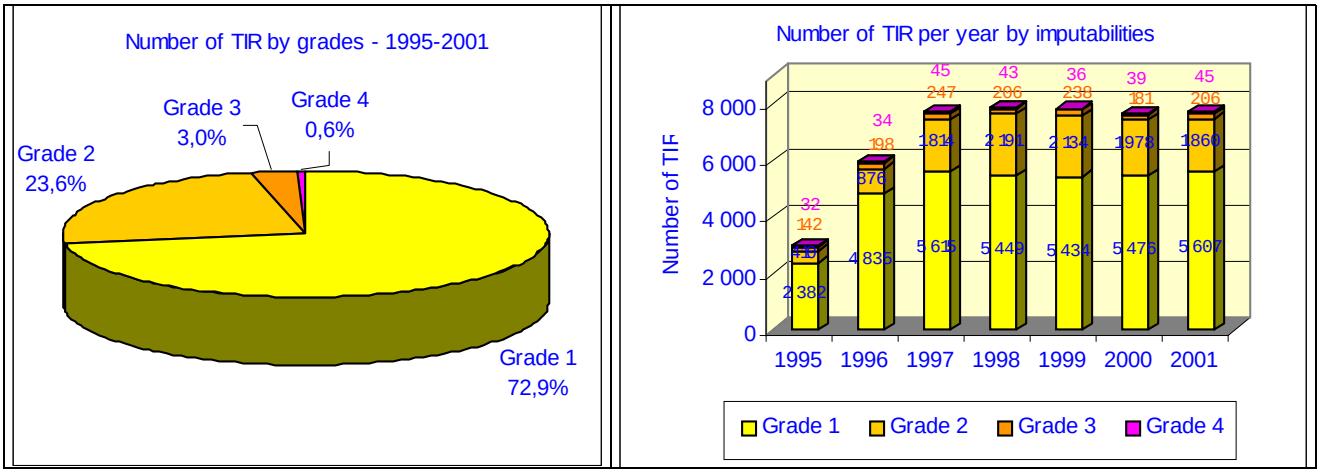
A general analysis of the transfusion incident report level in France since 1995 shows a plateau persisting since 1998, after a rapid growth phase. The transfusion incident report level remains homogeneous in terms of incident distribution, as much regarding seriousness as imputability levels after investigation. The slight decrease in the total number of notifications appears to be compensated by the decrease in the number of distributed and transfused blood products. Additionally, the incident/ product ratio remains stable in general. The analysis conclusion is the same when the study is restreined to incidents with an imputability equivalent or superior to 2.



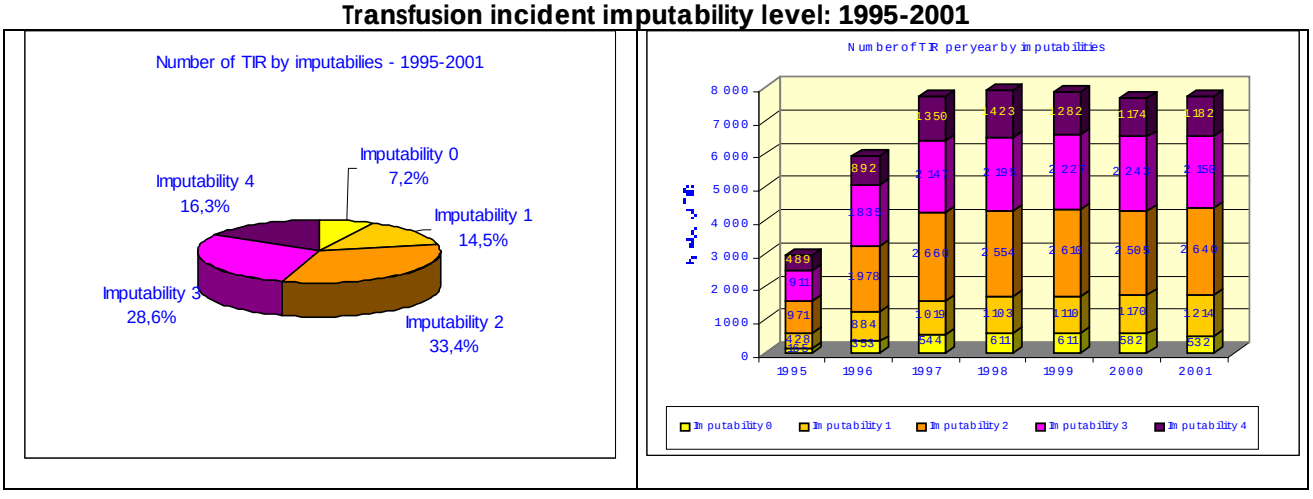
3.3.1.2. Incident distribution by grades and imputabilities

Without distinction of grades and imputabilities

Transfusion incident seriousness level: 1995-2001

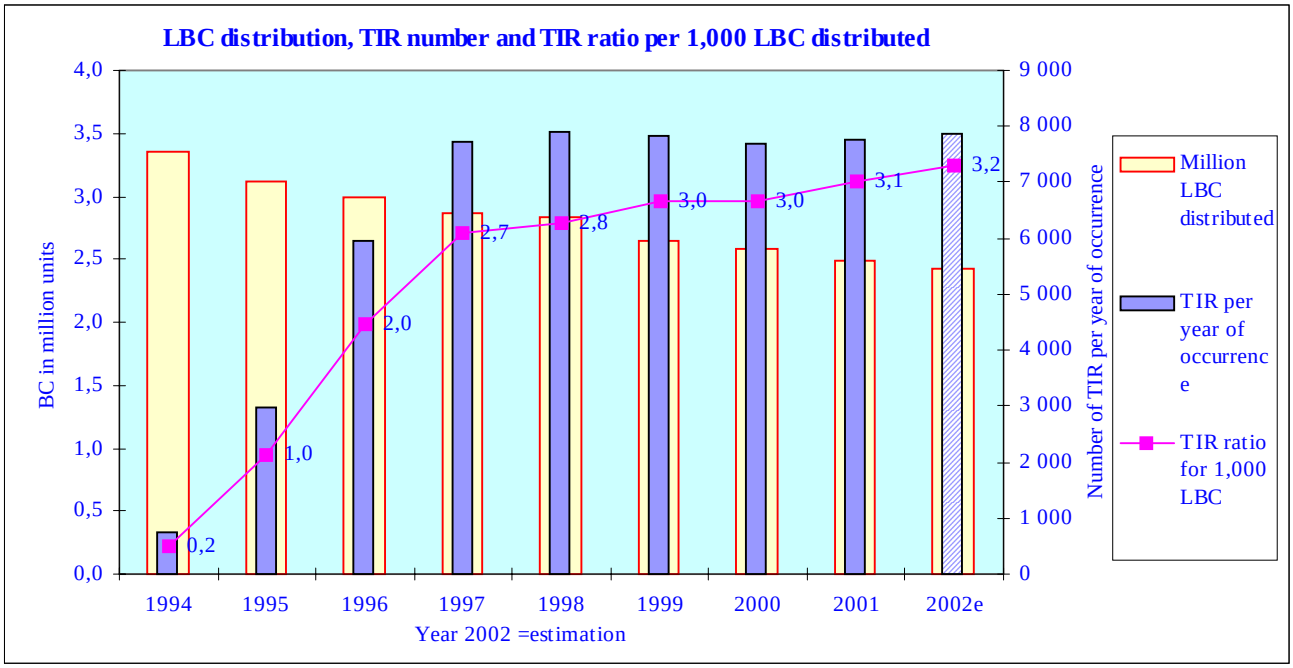


Transfusion incident imputability level: 1995-2001



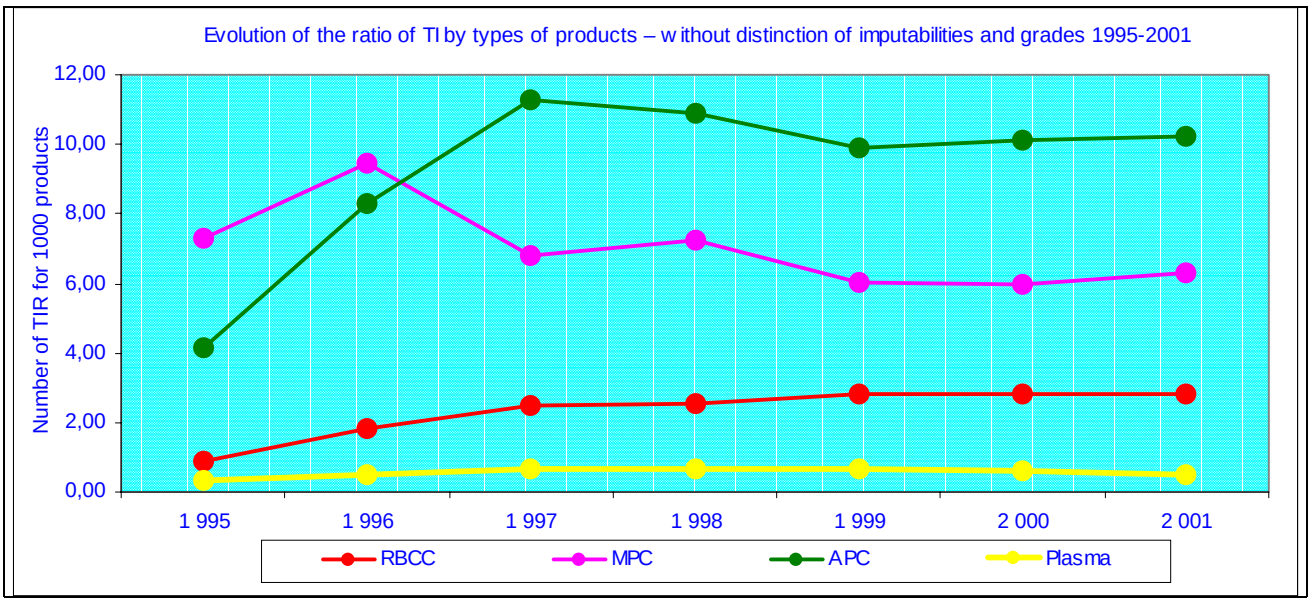
3.3.2. Haemovigilance Indicators

3.3.2.1. Global incident ratio for 1000 distributed products in 1995-2002

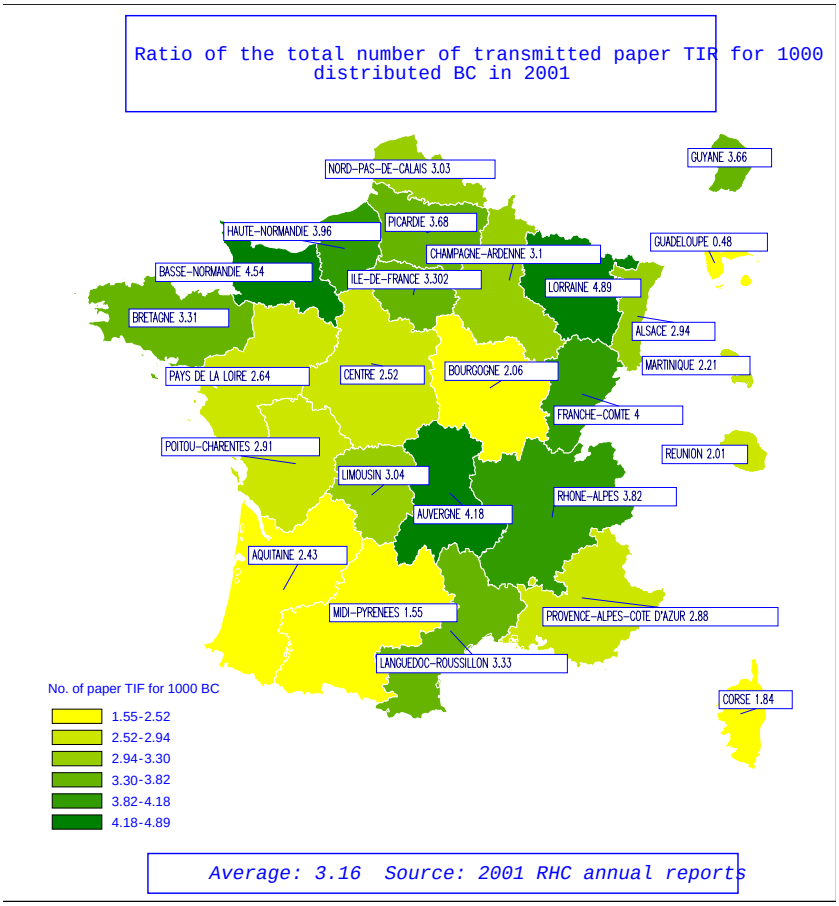


Every year, the number of incidents for 1000 distributed products in France ranges from 2.7 to 3.2, without distinction of seriousness. The ratio has now been steady around 3 ‰ for more than four years.

3.3.2.2. Incident ratio by types of distributed products (1000 products)



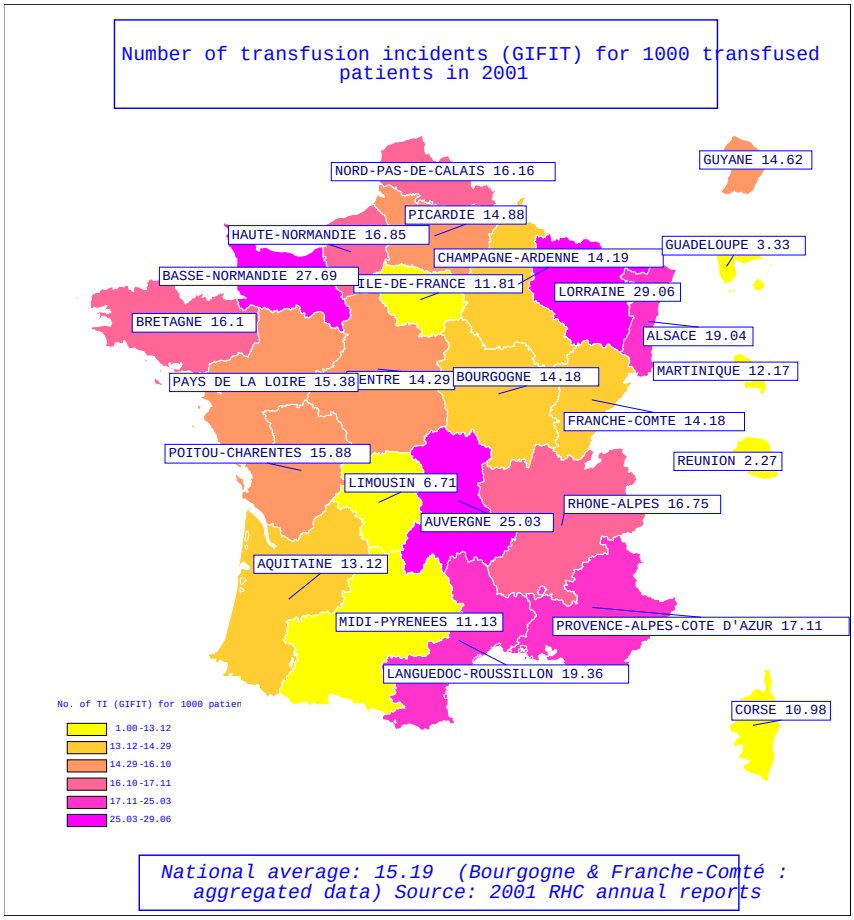
3.3.2.3. Incident number ratio by regions – 2001



Source 2001 RHC annual report

A reporting heterogeneity persists at the regional level, but differences are slowly reducing. The low value observed in the Midi-Pyrénées region is mainly imputable to a unique large size health care center. A correction shall be operated in 2002.

3.3.2.4. Incident number ratio for 1000 patients – 2001



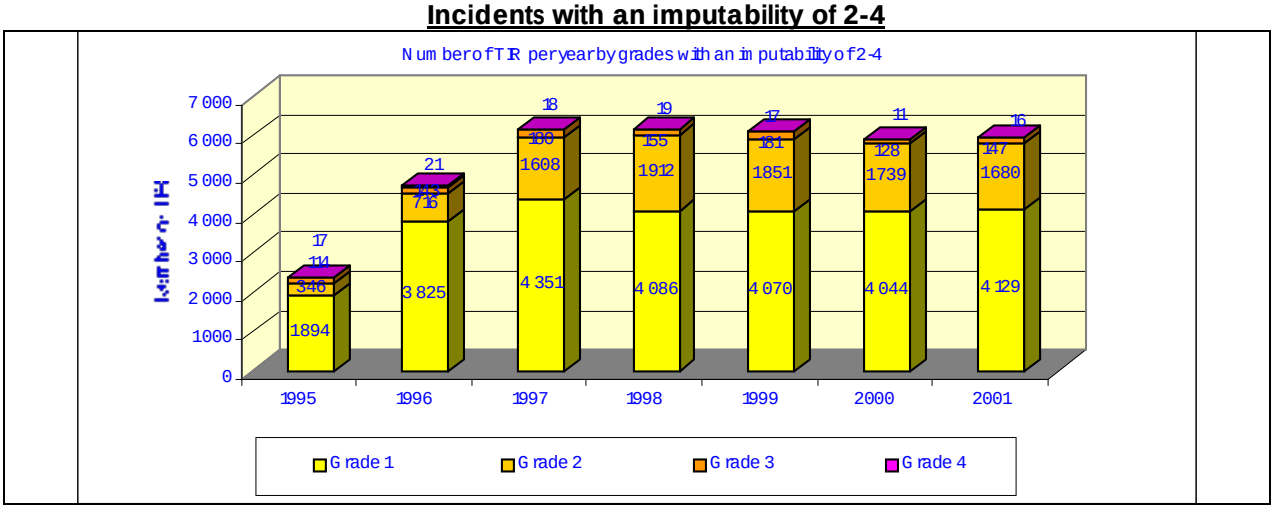
There exists quite a high disparity in the number of incidents reported for 1000 transfused patients between regions, with very distant extremes (mini 2.27 - maxi 29.06). This doesn't seem to be correlated either with the incident ratio for 1000 distributed BC, or with the number of transfused patients in the region. Furthermore, the reliability level of the transfused patient figure still remains imperfect (repetition of the information concerning polytransfused patients?). An analysis of the demographic caracteristics and transfusion indications by regions should be performed.

3.3.3. Incidents imputable to transfusion - imputability >= 2

Between 1995 and 2001, immediate incidents represented an average of 73.4% of the total number of TI, and delayed incidents an average of 24.2 %, without distinction of imputabilities or seriousness.

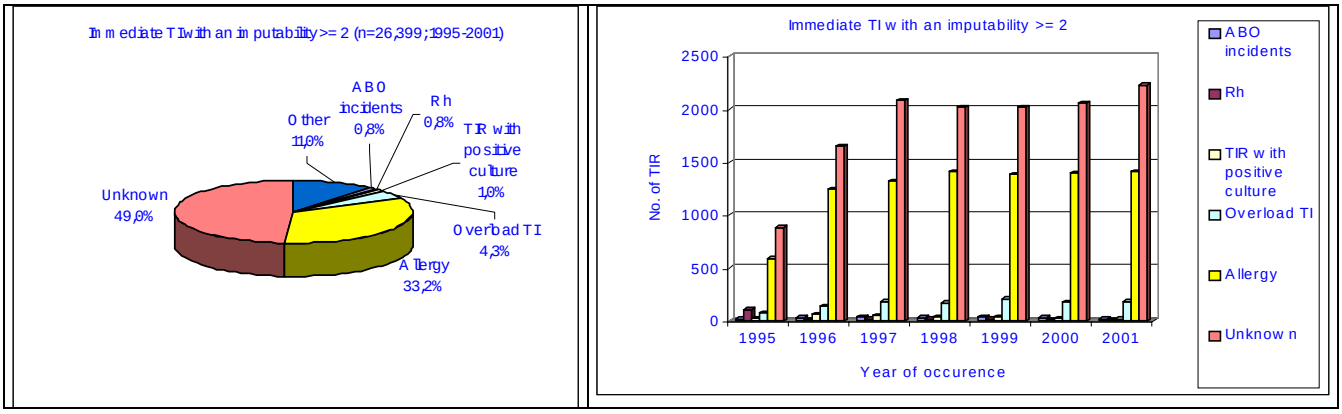
By convention, immediate accidents occur within 8 days following transfusion.

Incidents with an imputability of 2-4



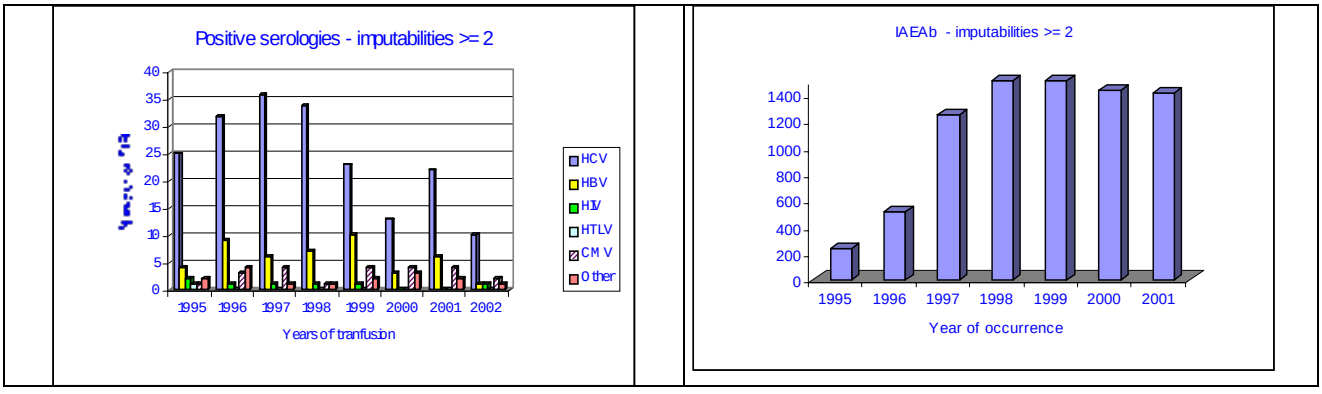
3.3.3.1. Principal immediate diagnoses with an imputability >= 2

The distribution of the main diagnosis categories has also remained stable since 1998, except a moderate increase of the « unknown » category in 2001 (see below chapter on non haemolytic febrile reactions).



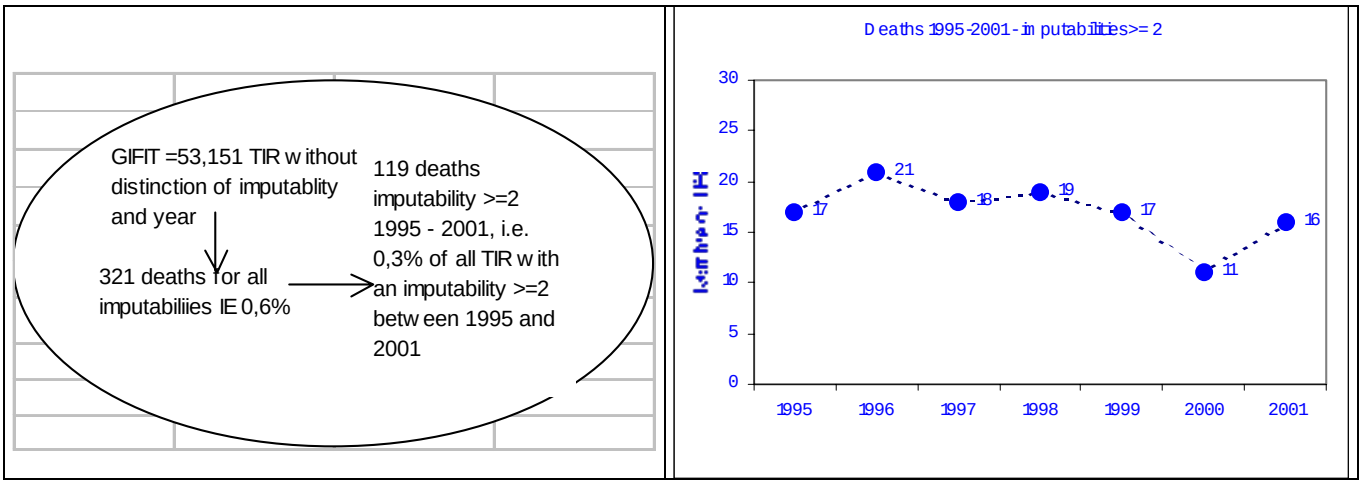
3.3.3.2. Delayed TIR - Principal delayed diagnoses with an imputability >= 2

IAEAb (post-transfusion irregular anti-erythrocyte antibodies) represent more than 78 % of the delayed TI on the studied period, and remain steady. On the contrary, a very high decrease in HCV and HIV post-transfusion positive serologies is observed as expected, even though these data concern all the notifications, including those where the transfusion responsibility could be excluded after investigation (see below).



3.3.4. Deaths

Since 1995, an average of 17 deaths per year with an imputability >=2 was recorded.



The annual average number of deaths highly imputable to transfusion has been steady at 17, and includes the first years.

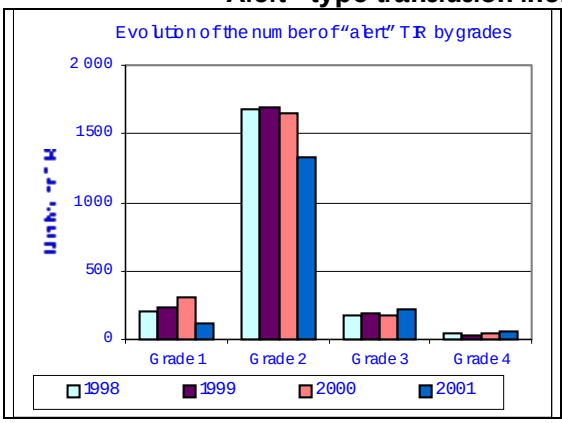
4. TRANSFUSION INCIDENTS – FOR ALL IMPUTABILITIES

The first part of the following analysis is about all the incidents (title 4), when the 2nd part focuses on incidents with an imputability equivalent or superior to 2 and for which an invesigation was completed (title 5).

4.1. Centralisation of " Alert " type transfusion incidents

The yearly average number of "Alert" type incident report forms, which are transmitted by post or fax, has been 2,100 for the past three years. The decrease noted in 2001 is mainly due to the modification of reception of grade 2 forms in relation to the occurrence of post-transfusion irregular anti-erythrocyte antibodies(these are now excluded from the "alert" category).

" Alert " type transfusion incident report forms between 1998 and 2001



	Grade 1	Grade 2	Grade 3	Grade 4	Total
TIR "alerte" 1998	208	1683	168	38	2097
Percentage	*9,90%*	*80,30%*	*8,00%*	*1,80%*	*100,00%*
TIR "alerte" 1999	231	1694	188	30	2143
Percentage	*10,80%*	*79,00%*	*8,80%*	*1,40%*	*100,00%*
TIR "alerte" 2000	300	1651	172	44	2167
Percentage	*13,80%*	*76,20%*	*7,90%*	*2,00%*	*100,00%*
TIR "alerte" 2001	120	1326	225	58	1729
Percentage	*6,90%*	*76,70%*	*13,00%*	*3,40%*	*100,00%*

4.2. Centralisation of GIFIT electronic incident report forms (for all grades)

4.2.1. Per year

Incident notification year according the year of occurrence – 1995/2001

	Notification year								
Year of occurrence	Other years	1995	1996	1997	1998	1999	2000	2001	Total
Other years	4247	79	176	226	249	188	106	127	5398
1995	6	2696	101	49	41	46	17	10	2966
1996	11		5627	174	64	37	16	14	5943
1997	8			7401	241	36	20	15	7721
1998	10				7645	172	39	23	7889
1999	8					7611	185	38	7842
2000	7						7508	159	7674
2001	134							7584	7718
Total	4431	2775	5904	7850	8240	8090	7891	7970	53151

4.2.2. TI according to seriousness and imputability

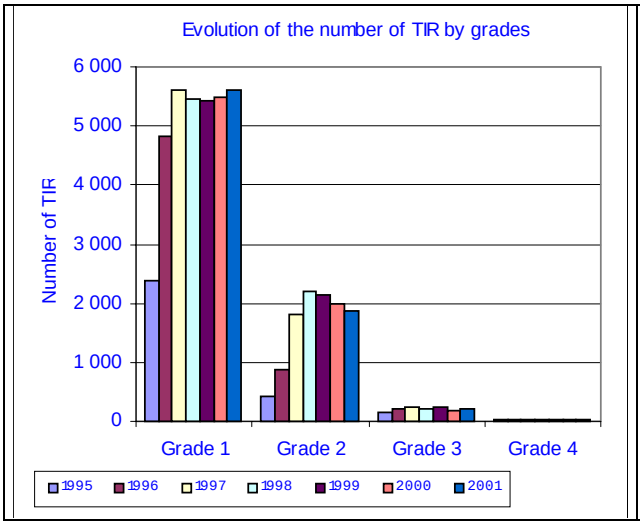
4.2.2.1.Seriousness and imputability cross table – aggregated data

Seriousness and imputability distribution N=53,151 – without distinction of year

	Grade 1	Grade 2	Grade 3	Grade 4	Total	%
Imputability 0	2 237	1 210	180	92	3 719	7,0%
Imputability 1	6 889	452	220	77	7 638	14,4%
Imputability 2	14 294	3 435	317	78	18 124	34,1%
Imputability 3	10 823	3 838	447	35	15 143	28,5%
Imputability 4	3 722	4 349	408	39	8 518	16,0%
Not documented	8	1			9	0,0%
Total	37 973	13 285	1 572	321	53 151	100,0%
%	71,4%	25,0%	3,0%	0,6%	100,0%	

4.2.2.2. TI according to seriousness per year – 1995/2001

Electronic transfusion incident report forms - GIFIT - 1995 to 2001



Year	Grade 1	Grade 2	Grade 3	Grade 4	Total
1995	2 382	410	142	32	2 966
1996	4 835	876	198	34	5 943
1997	5 615	1 814	247	45	7 721
1998	5 449	2 191	206	43	7 889
1999	5 434	2 134	238	36	7 842
2000	5 476	1 978	181	39	7 674
2001	5 607	1 860	206	45	7 718

4.2.3. Immediate and delayed TI without distinction of imputability and gravity – 1995/2001

Year of occurrence	1995	1996	1997	1998	1999	2000	2001	***1995-2001***
Immediate TI	2415	4778	5523	5459	5519	5585	5772	***73.5 %***
Delayed TI	493	955	1899	2238	2159	1973	1859	***24.2%***
Immediate & delayed TI	14	20	27	16	18	6	13	***0.2%***
Not documented	42	189	271	173	144	110	74	***2.1%***
Total	2964	5942	7720	7886	7840	7674	7718	***100.0%***

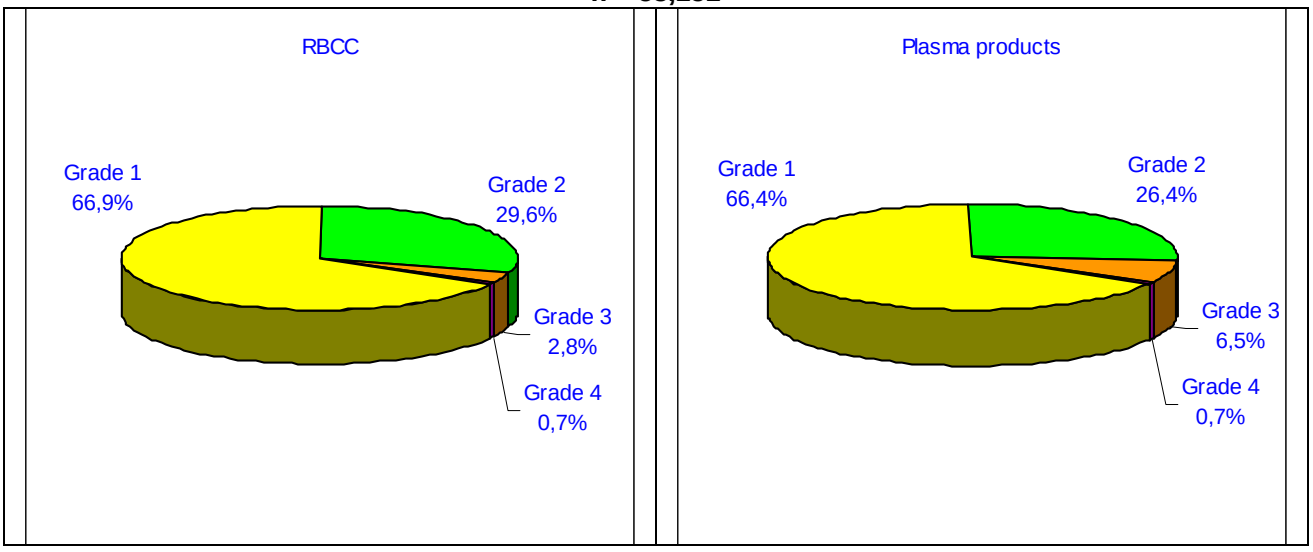
In average, 2.1% of TI are not appropriately of not documented at all. Such percentage, which reflects the quality of the form data keyboarding, has been significantly improving for the last two years.

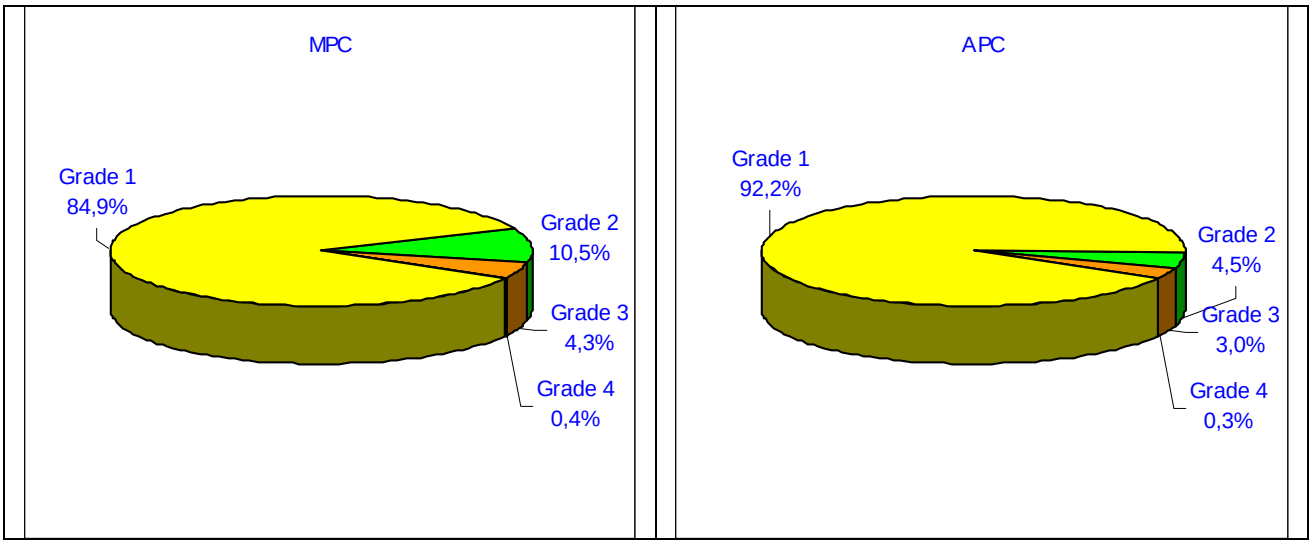
4.3. Incriminated products in transfusion incidents

4.3.1. Evolution 1995/2001

4.3.1.1. TI distribution by products and grades – without distinction of years

n = 53,151

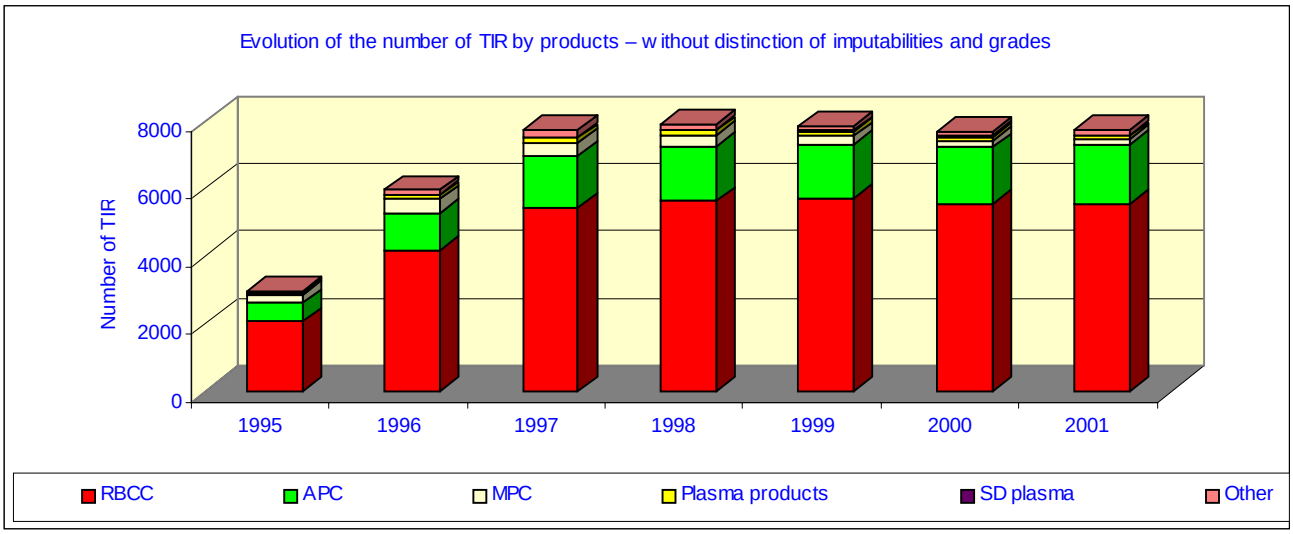




The global distribution of incident seriousness by types of products used indicates a greater proportion of grade 2 incidents with RBCC, in relation with the expected occurrence of anti-erythrocyte antibodies. On the contrary, the high proportion of grade 2 incidents observed with plasma products seems to be linked with HCV post-transfusion serologies (80% of grade 2 incidents). Such observation is at present unexplained.

4.3.1.2. Evolution of TI by products 1995/2001

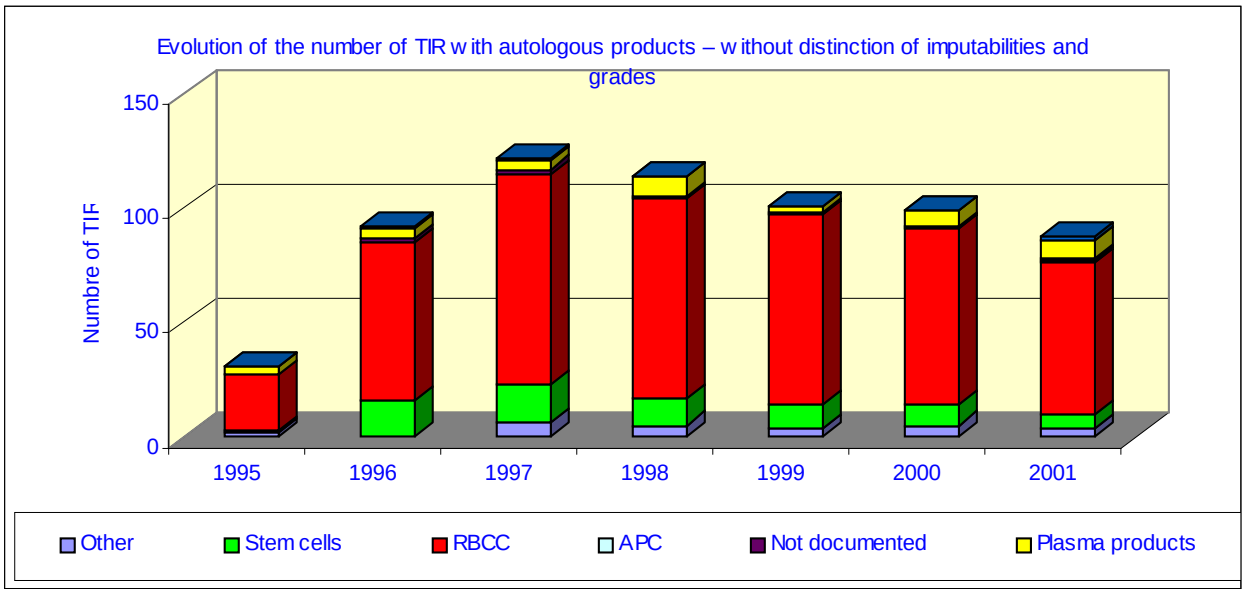
4.3.1.2.1. TI reported for all products



	1995	1996	1997	1998	1999	2000	2001
RBCC	2058	4150	5442	5622	5719	5539	5522
APC	539	1115	1524	1606	1566	1664	1773
MPC	245	417	394	338	256	195	161
Plasma products	67	103	128	141	144	132	87
SD plasma	7	17	30	23	26	29	38
Other	50	141	203	159	131	115	137
Total	2966	5943	7721	7889	7842	7674	7718

As already mentioned (3.3.2.2) for the incident ratio by types of distributed products (1000 products), the distribution of incidents by transfused products has been steady in time.

4.3.1.2.2. TI with autologous products

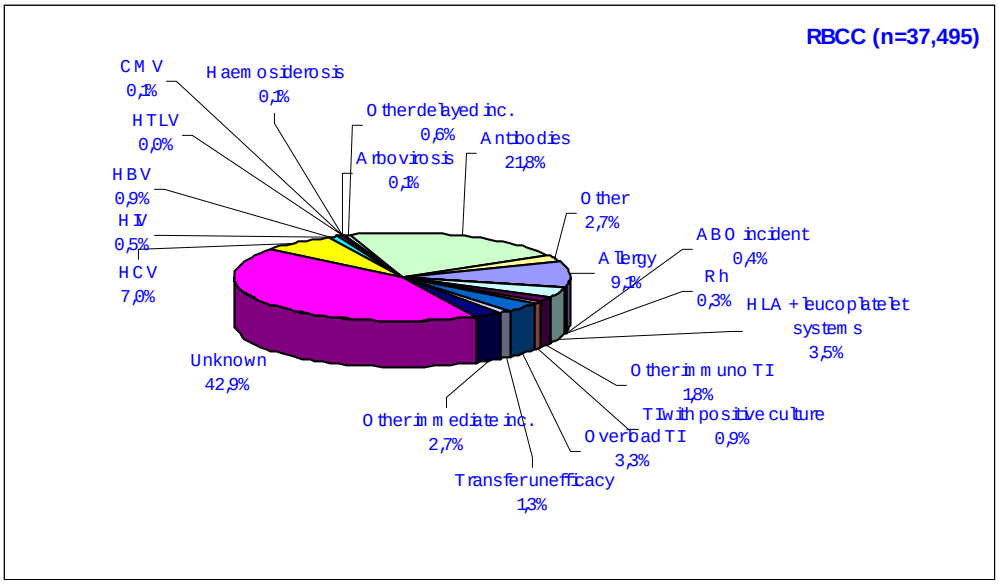


The number or transfusion incidents reported after the use of autologous products has been decreasing parallel to the number of products used. There is a high proportion (75 to 82%) of incidents linked to the use of RBCC. Global incidence by transfused products in 2001 is of 0.68 incident for 1000 distributed autologous products, and 1 incident for 1000 autologous RBCC.

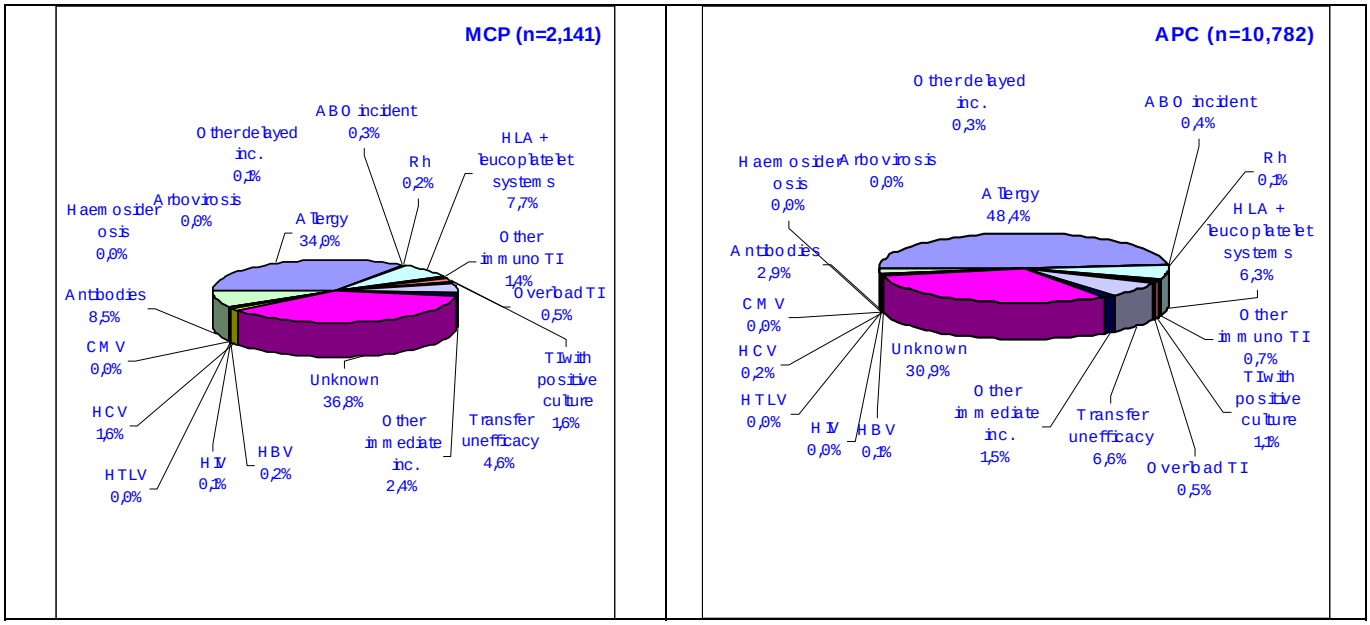
	1995	1996	1997	1998	1999	2000	2001
RBCC	24	69	92	87	83	77	66
WB		1	1				2
APC							1
Plasma products	4	4	4	9	3	7	8
Stems cells	1	16	17	12	10	9	6
Other	2		6	5	4	5	4
Not documented		2	2	1	1	1	1
Total	31	92	122	114	101	99	88

4.3.1.3.Types of diagnoses by transfused products – without distinction of years

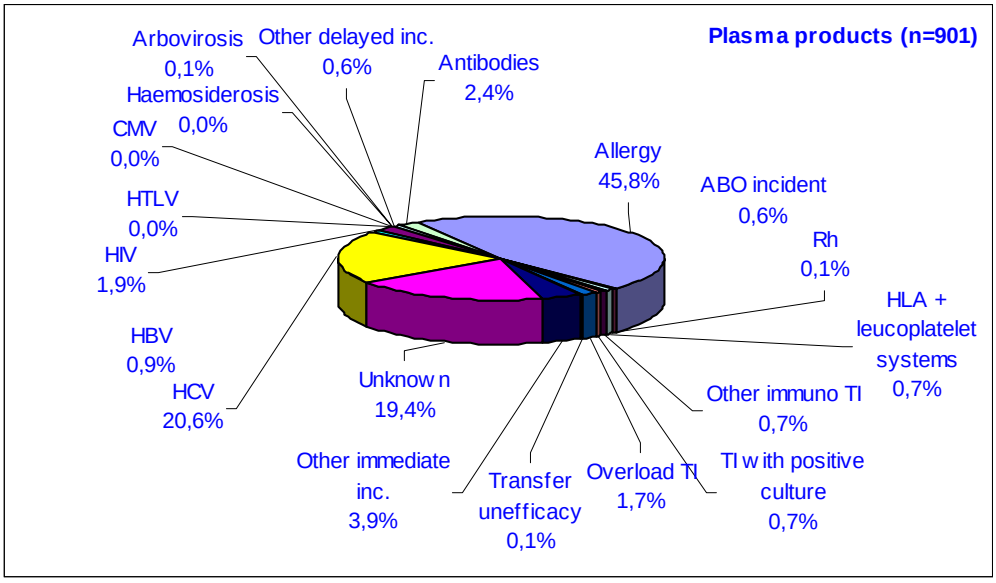
4.3.1.3.1. “RBCC” incident diagnoses



4.3.1.3.2. “Platelet concentrate” incident diagnoses



4.3.1.3.3. “Plasma product” incident diagnoses

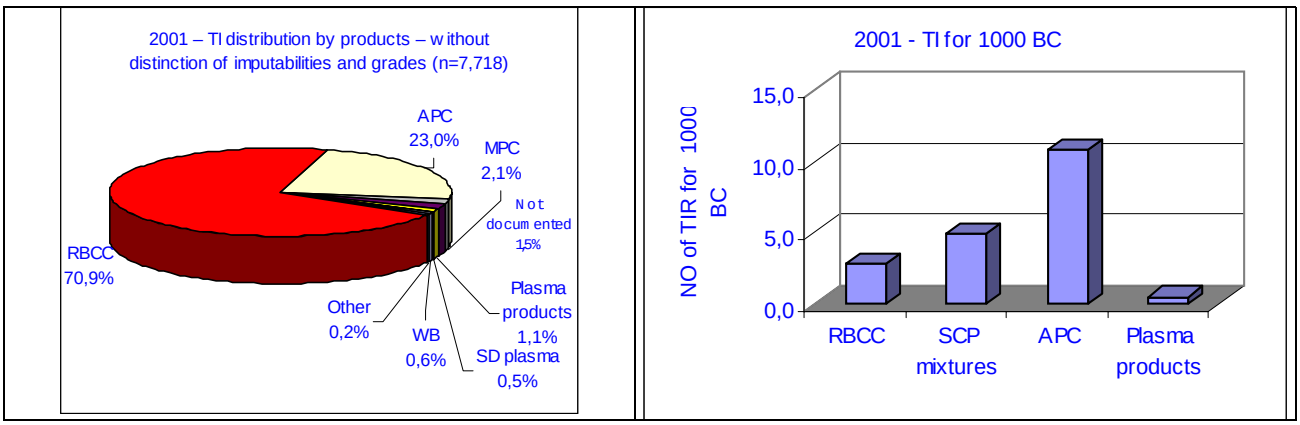


The expression of diagnosis categories by types of transfused products, for the whole database, without distinction of seriousness grades or imputabilities, gives a similar distribution for apheresis platelet concentrates and standard concentrate mixtures, substantially represented by allergic reactions (48% with APC) and febrile or unknown reactions (37% with MCP).
Allergic reactions appear to be as frequent with plasma products, but far less reported with RBCC, even when anti-erythrocyte antibodies, which are specific to RBCC, are excluded.

4.3.2. Year 2001

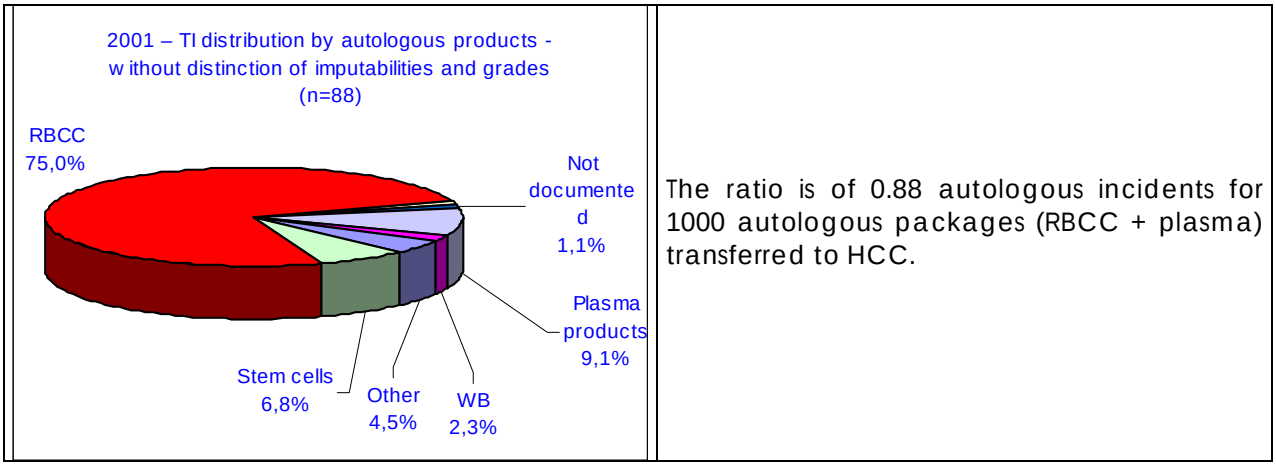
4.3.2.1. 2001 – For all products

Most TI are attributable to RBCC (70.9%); however, RBCC represent 77% of distributed units.



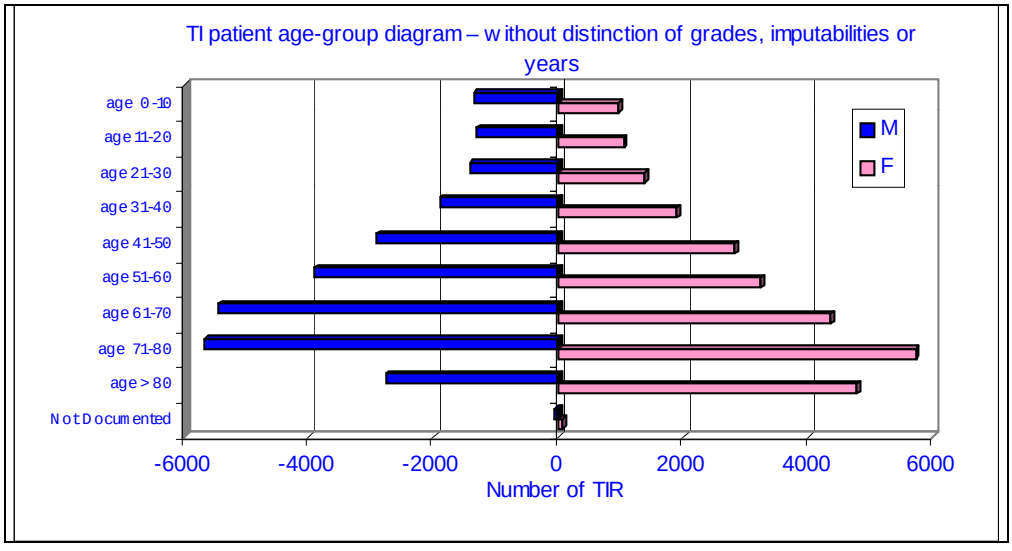
The incidence of TI by types of products for 1000 distributed BC has remained stable in 2001 compared to the previous years (cf. 3.3.2.2).

4.3.2.2. …Among which autologous products



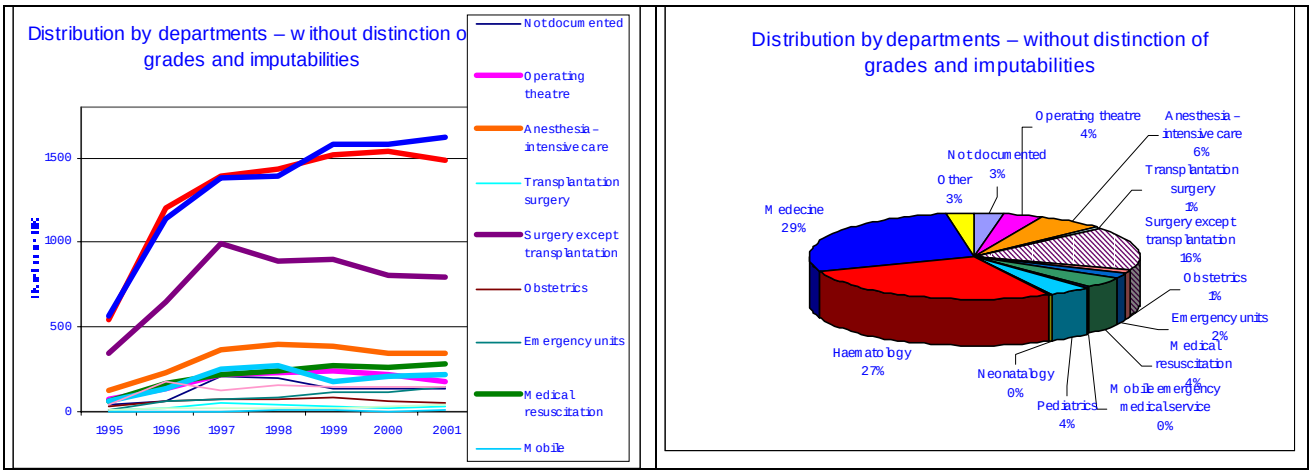
The ratio is of 0.88 autologous incidents for 1000 autologous packages (RBCC + plasma) transferred to HCC.

4.4. Patients' age



The age distribution shows a high proportion of elderly patients, with a defect for men above the age of 80 ("gap" due to the first world war in 1914-1918 ?). A comparison of these data with the transfused patient profiles (data not available) shall be conducted.

4.5. *Transfusion incident notification origins*

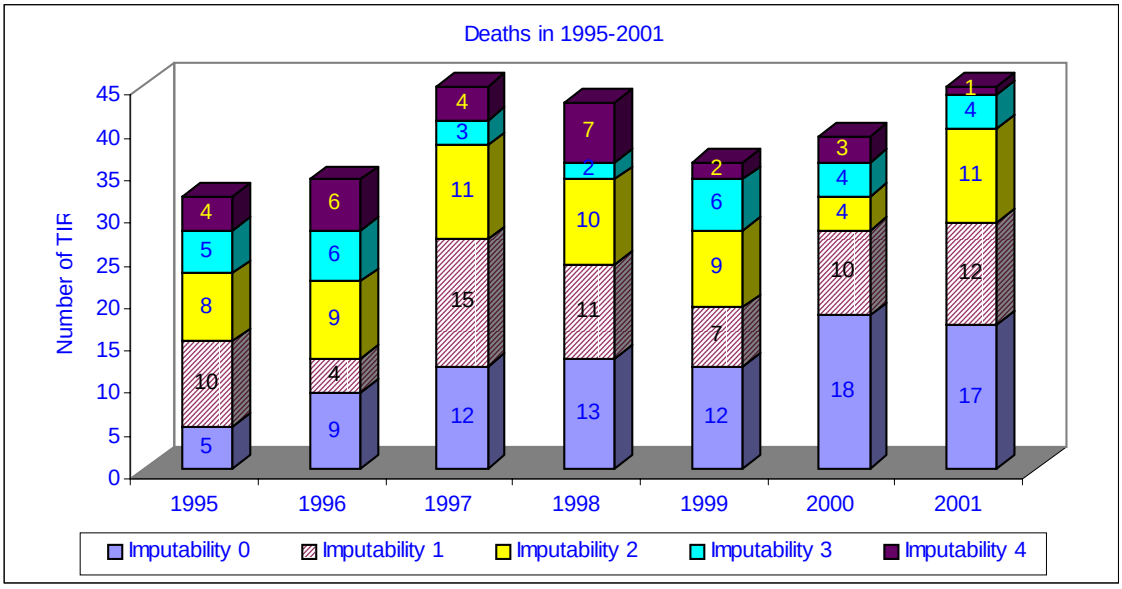


A first analysis of the transfusion incident notification origins shows a dominant part (29 et 27%) for haematology and medecine departments. A confrontation to the available data on the use of BC in these hospitalisation sectors is necessary. A decrease in incidents reported in both surgery and operating sectors has been observed, probably in relation to a reduction in the use of BC in surgery (economies, salvage pre- and post-surgery).

4.6. *Deaths*

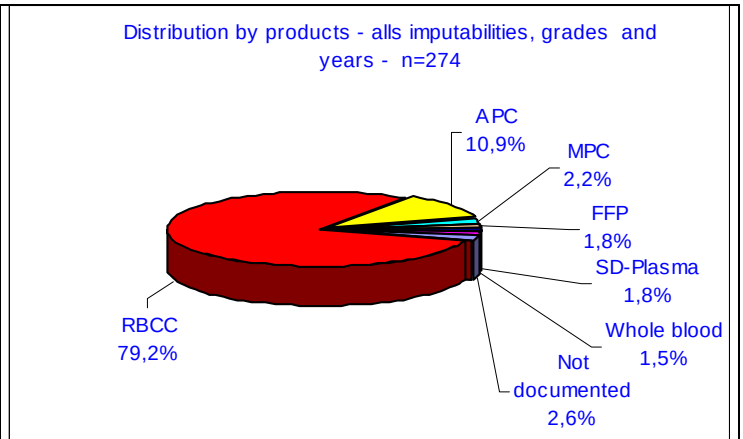
4.6.1. Deaths between 1995 and 2001 - Aggregated data –

4.6.1.1. Evolution by imputabilities -1995/2001



4.6.1.2. Incriminated products in case of death

For all years	TIR
RBCC	217
APC	30
MPC	6
Whole Blood WB	4
Fresh frozen Plasma	5
SD products	5
Not documented	7
Total	274



4.6.1.3. Main causes of death - 1995/2001

Immediate diagnoses represent the main risks of death (82.12% of cases).

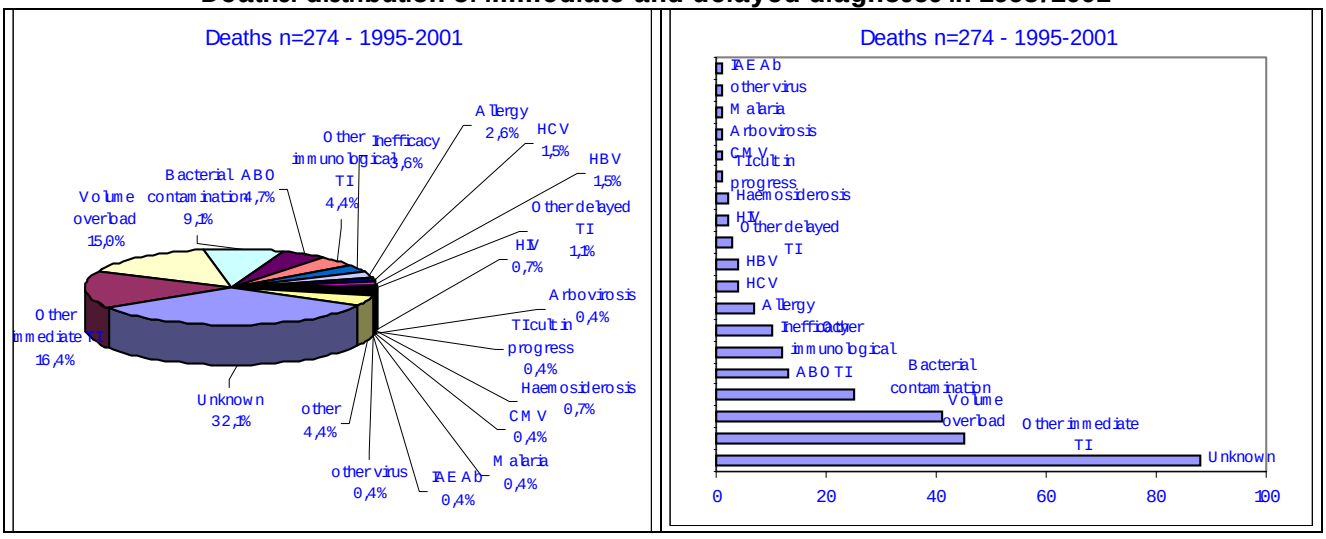
Deaths: immediate and delayed TI – 1995/2001

	Nombre	%
Immediate TI	225	82.12
Delayed TI	25	9.12
Immediate & delayed TI	3	0.36
Not documented	21	7.66
Total	274	100.00

(selection criteria grade=4: i.e. N=274 TIR out of 47,753 TIR between 1995 and 2001, without distinction of imputabilities or seriousness)

4.6.1.3.1. Main death diagnoses – for all imputabilities 1995/2001

Deaths: distribution of immediate and delayed diagnoses in 1995/2001



The study of the main death diagnosis categories significantly brings out four causes of death apart from the "unknown" category (volume overload blood, Incident by bacterial contamination, ABO errors, and immunologic incompatibilities), which were marginal compared to the rest of incidents.

4.6.1.3.2. Imputability of diagnoses with death - 1995/2001

Immediate diagnoses - 1995/2001 *

Imputability	Allergy	ABO	TI with cult.	Overload	Unknown
Imputability 0	0	0	5	4	29
Imputability 1	1	1	5	2	44
Imputability 2	4	2	4	18	14
Imputability 3	1	3	3	14	0
Imputability 4	1	7	8	3	1

** Year of occurrence*

Delayed diagnoses - 1995/2001 *

Imputability	HCV	HBV	HIV	CMV	IAEAb
Imputability 0	2	3			
Imputability 1	1	1			
Imputability 2	5		3	1	
Imputability 3	2				
Imputability 4			1	1	1

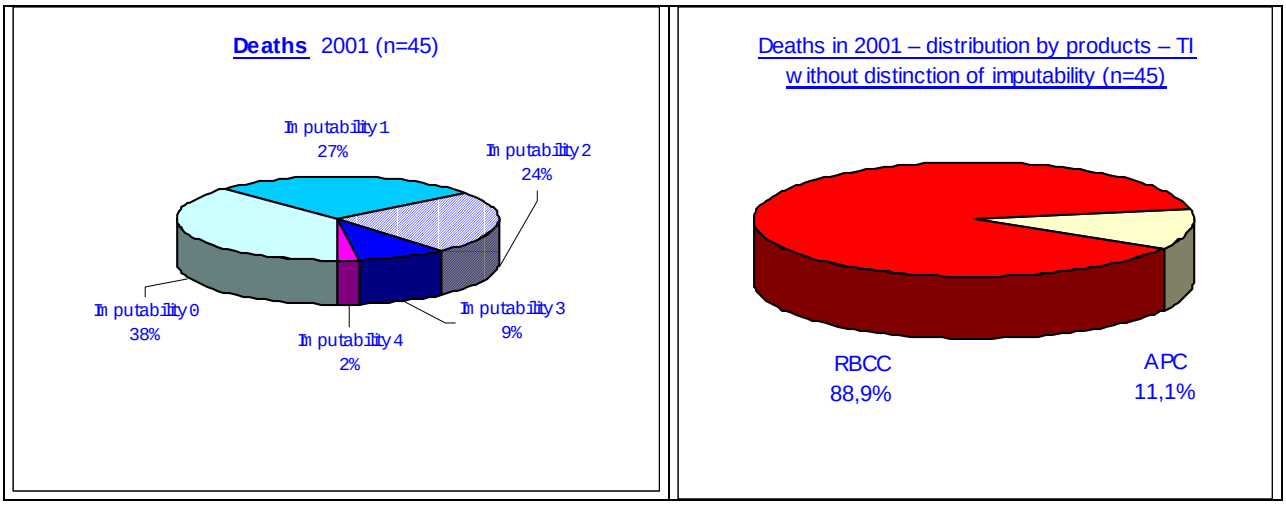
** Year of transfusion if documented*

It should be mentionned that less than half of the reported deaths are imputable to transfusion (after investigation, imputability > or = 2) on the whole period. Imputabilities 0 and 1 represent 79% of the "unknown" diagnosis category.

4.6.2. Deaths in 2001

In 2001, the GIFIT database recorded 45 deaths – without distinction of imputabilities -, corresponding to a mortality ratio of 1.8 for 100,000 distributed BC.

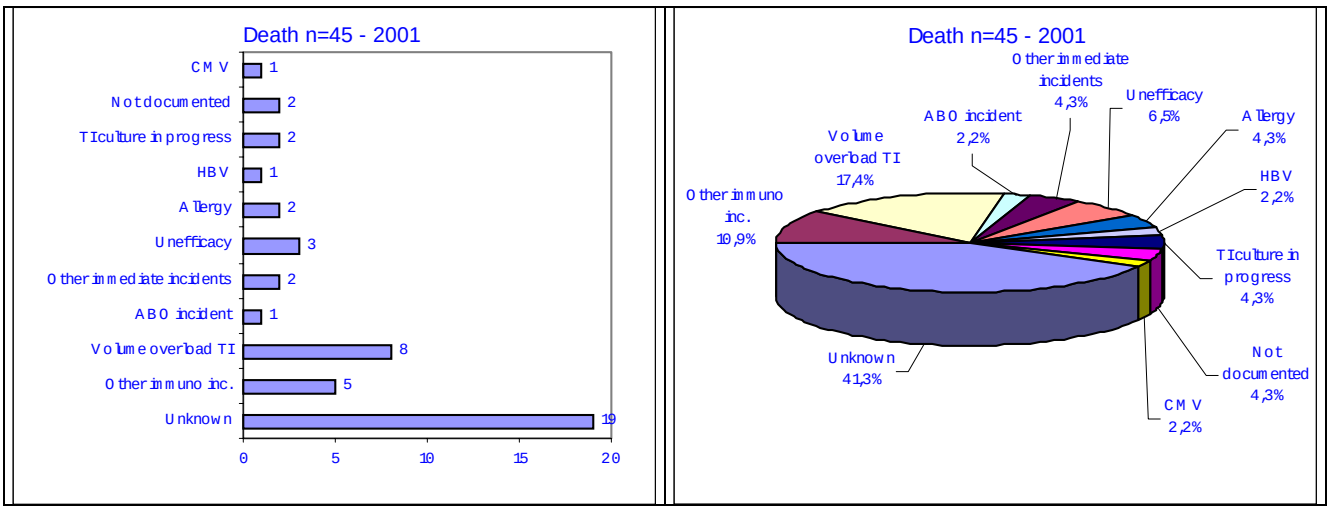
4.6.2.1. Death distribution by imputabilities and by products in 2001



It shall be reminded that RBCC represent 77 % of distributed BC and APC 6.5 %.

4.6.2.2. Principal diagnoses of death in 2001

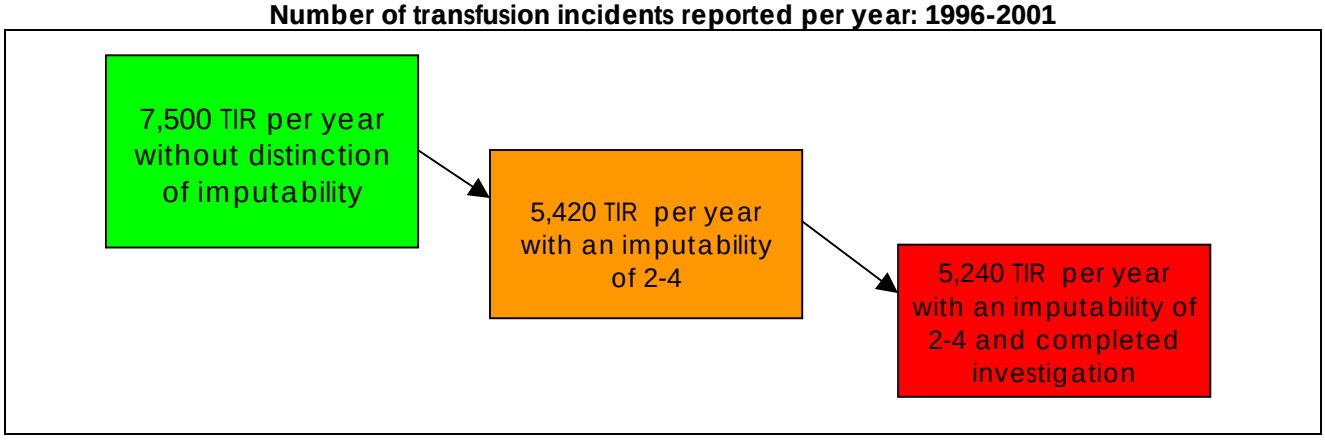
The main causes of death associated with blood transfusion in 2001 are: unknown type diagnoses, volume overload blood, immunologic incompatibilities...

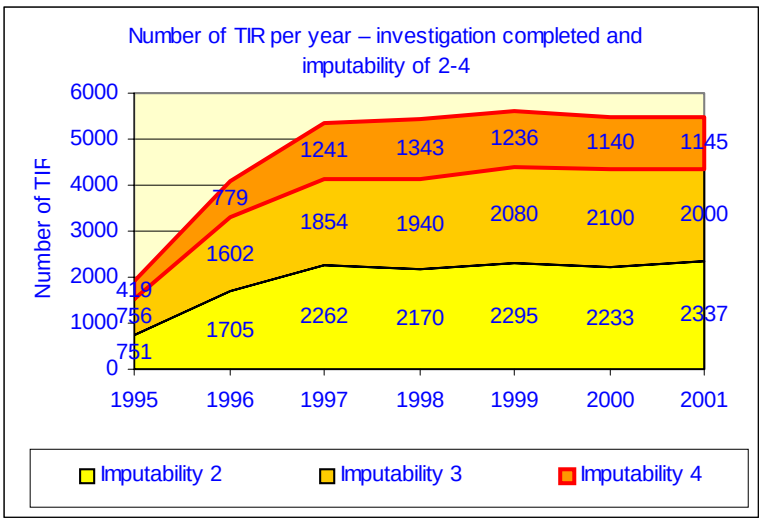


Diagnosis distribution in 2001 doesn't differ from that observed on the whole period.

5. TRANSFUSION INCIDENTS WITH AN IMPUTABILITY >=2 AND COMPLETED INVESTIGATION

Number of transfusion incidents reported per year: 1996-2001





The data showed in this chapter are relative to incidents, the tranfusion origin of which is uncertain, probable or possible. Excluded or uncertain transfusion imputability incidents were not analysed, so as to enable comparison with the data from other haemovigilance systems.

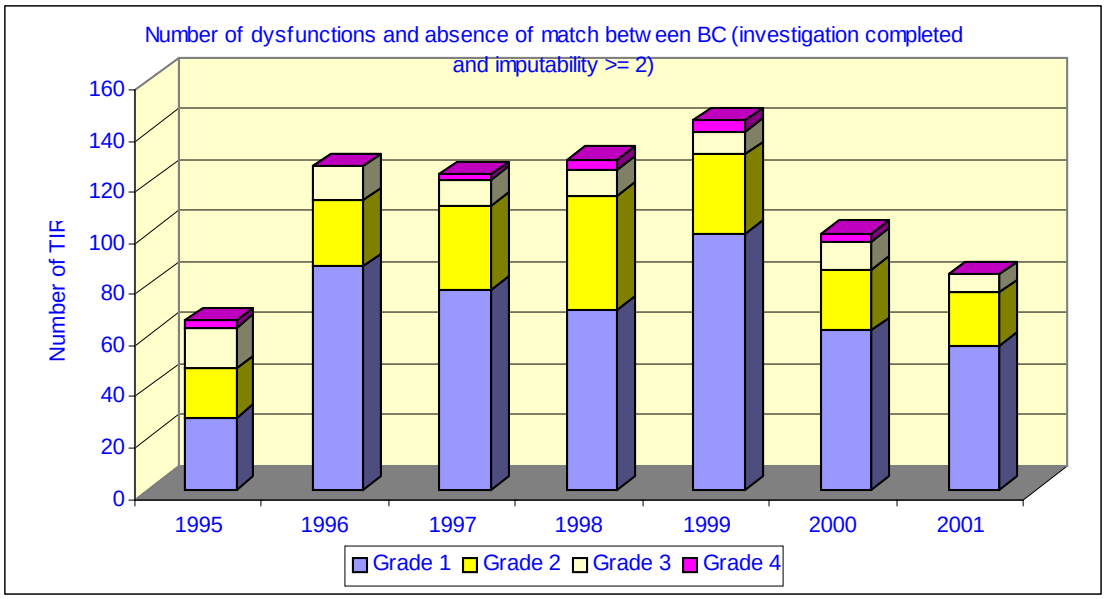
5.1. Presumed dysfunctions and absence of match between BC and patient's group

Definition: are considered as dysfunctions, incidents reported by correspondents as presumed dysfunctions and "absence of match" between distributed and transfused BC (items on the transfusion incident report form). The analysis is made separately from the incident diagnosis category.

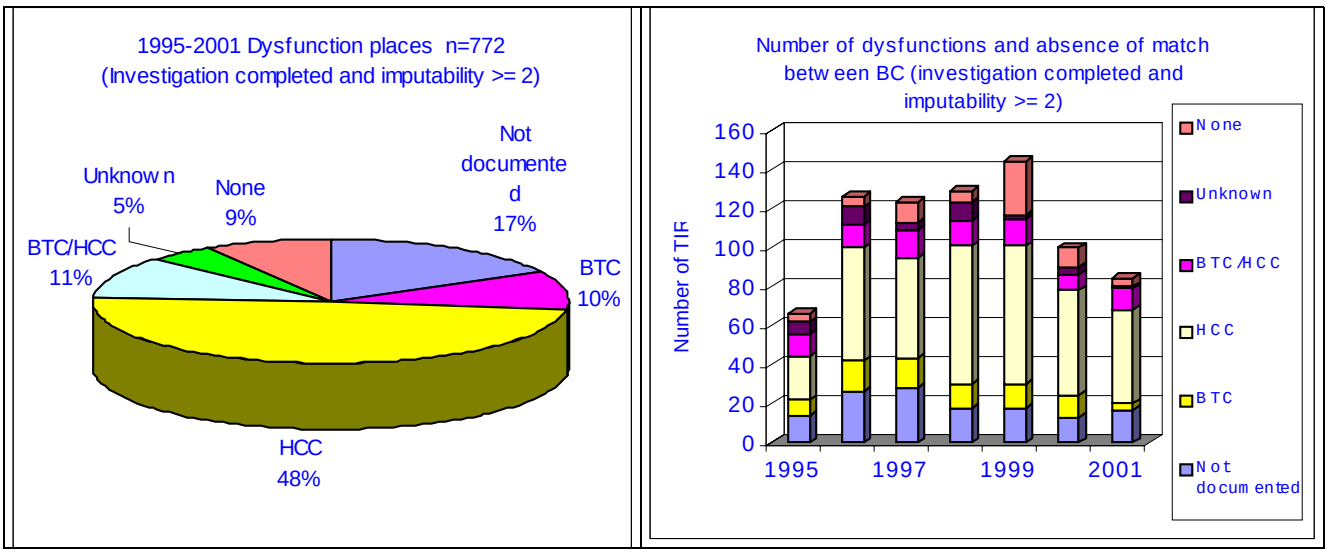
5.1.1. Evolution of the number of dysfunctions and absence of match between distributed/transfused BC

Number of dysfunctions - Investigation completed and imputability >=2

1994	1995	1996	1997	1998	1999	2000	2001
36	66	126	123	129	144	100	84



5.1.2. Dysfunction places



5.1.3. Dysfunction in 2001

Distribution method – investigation completed and imputability >=2

Storage		Nominative allocation: yes	Nominative allocation: no
Medicalized storage: yes	Emergency storage: no	8	10
Medicalized storage: no	Emergency storage: yes		2
Medicalized storage: no	Emergency storage: no	60	4

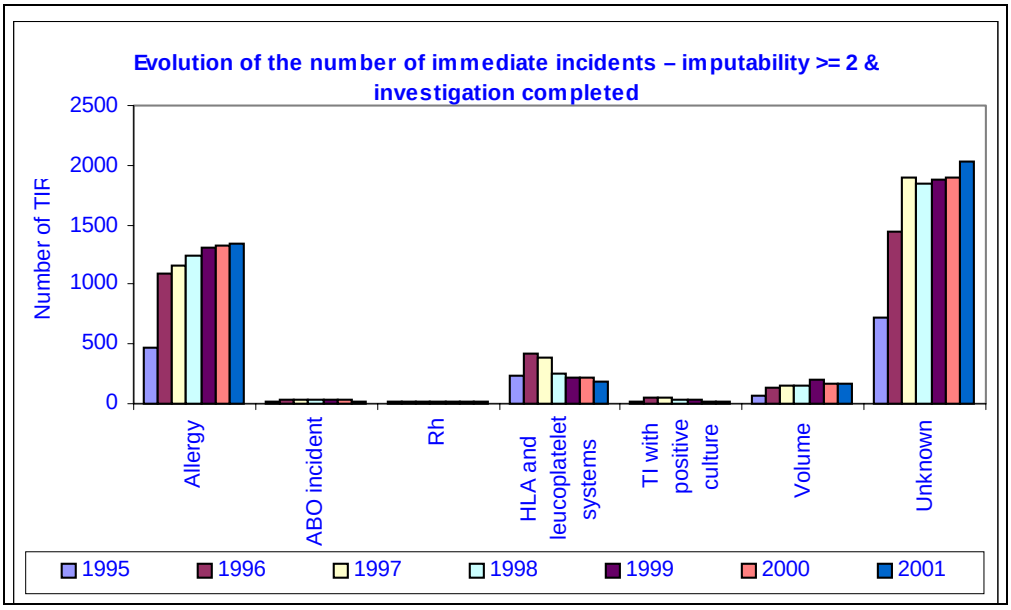
A decrease in the number of reported incidents with dyfunctions has been noted for years 2000 and 2001, without satisfactory explanation. The responsibility of Health Care Centers still represents a large majority since BTC are involved in 20% of cases only. Distribution from a blood storage site (emergency or not) appears as a circumstance for dysfunction in 31% of cases.

5.2. Principal diagnoses

5.2.1. Synthesis – immediate and delayed diagnoses

5.2.1.1. Immediate incidents

Principal immediate diagnoses: all immediate adverse reactions are reported to haemovigilance correspondents within 48 hours.



A slight modification of the diagnosis category distribution has been noted on the whole data, mainly for years 2000 and 2001. Allergic reactions and volume overload cases have been steady. ABO errors and TIBC have decreased, and febrile reactions (or "unknown" category) show a slight increase.

Year of occurrence	1995	1996	1997	1998	1999	2000	2001
Immunologic causes among which:							
Allergy	472	1089	1154	1248	1311	1331	1337
ABO	19	27	33	30	36	29	17
Rh	13	16	16	15	12	13	15
HLA and leuco-platelet systems	239	426	388	252	214	213	184
Non immunologic causes among which:							
TI with positive culture	20	57	47	35	34	23	18
Volume overload	66	127	152	156	202	175	166
Unknown category	719	1435	1892	1854	1878	1891	2032

5.2.1.2. Delayed incidents – imputability of 2-4

5.2.1.2.1. Post-transfusion positive serologies

Post-transfusion serologies per year of transfusion – imputability of 2-4

	1995	1996	1997	1998	1999	2000	2001
HCV	13	12	9	12	6	3	4
HBV	3	6	2	2	4	1	1
HIV	2			1	1		
HTLV							
CMV	1	2	3	1	4	3	2
Arbovirosis	1	4		1		1	
Other	1				1		

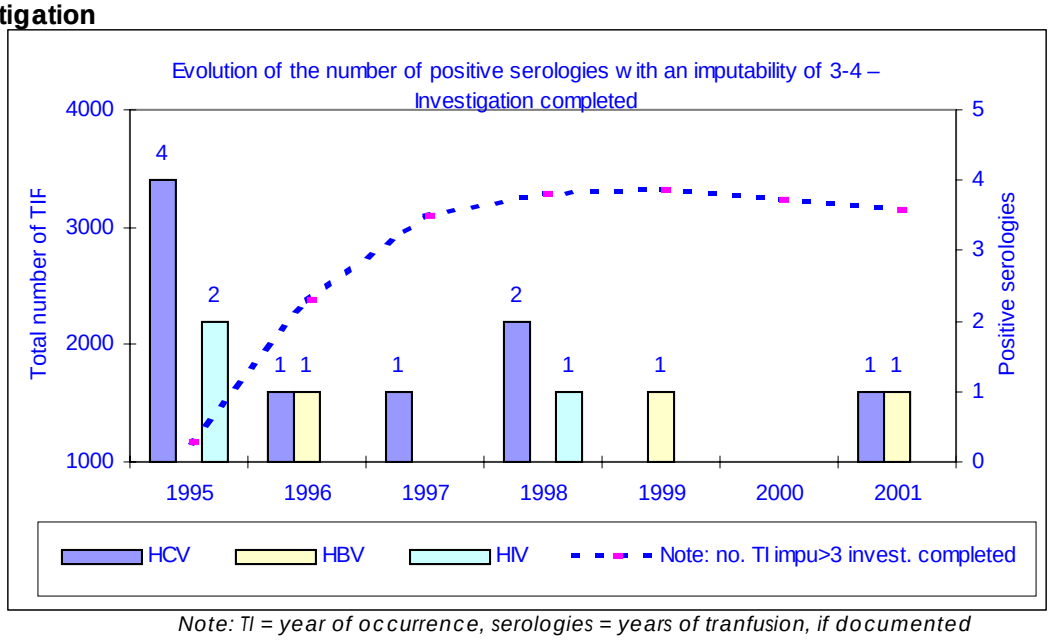
Post-transfusion serologies per year of transfusion – imputability of 3-4

	1995	1996	1997	1998	1999	2000	2001
HCV	4	1	1	2			1

HBV		1			1		1
HIV	2			1			

Note: TI = year of occurrence, serologies = years of transfusion, if documented.

... among which post-transfusion positive serologies with an imputability of 3-4 and completed investigation



Note: TI = year of occurrence, serologies = years of tranfusion, if documented

A high decrease in the number of reported post-transfusion positive serologies in the whole database is noted. These investigations now most often lead to excluded or uncertain imputability. Proven or probable HIV and HCV transmission cases have almost totally disappeared, with a unique case of VHC and VHB each in 2001. A proven HIV transmission case was reported at the beginning of the year 2002.

5.2.1.2.2. Post-transfusion anti-erythrocyte antibodies

IAEAb per year of occurrence

	1995	1996	1997	1998	1999	2000	2001
IAEAb	202	459	1132	1392	1444	1384	1363

As far as delayed incidents are concernced, anti-erythrocyte antibodies reporting has been perfectly stable since 1998. At present, no use is made of that type of incident due to the absence of accessibility of the antibody specificity criteria. A study can be conducted when the new report form is implemented in 2003.

5.2.2. ABO immunologic incompatibilities

Criteria: ABO-type immunologic incompatibility reported on Transfusion Incident report forms. This diagnosis category doesn't take into account assignment errors which don't include ABO or Rh incompatibilities (incorrect blood component transfused from the Anglo-Saxons' terminology).

5.2.2.1. 1995-2001 Evolution of the number of ABO

A decrease in reported ABO incidents has been noted since 1999, a tendency that should be confirmed in the years to come. Several hypotheses can be put forward:

- delay in the GIFIT keyboarding,

- grade 1 ABO incident underreporting,

- ABO incidents without clinical or biological manifestations,

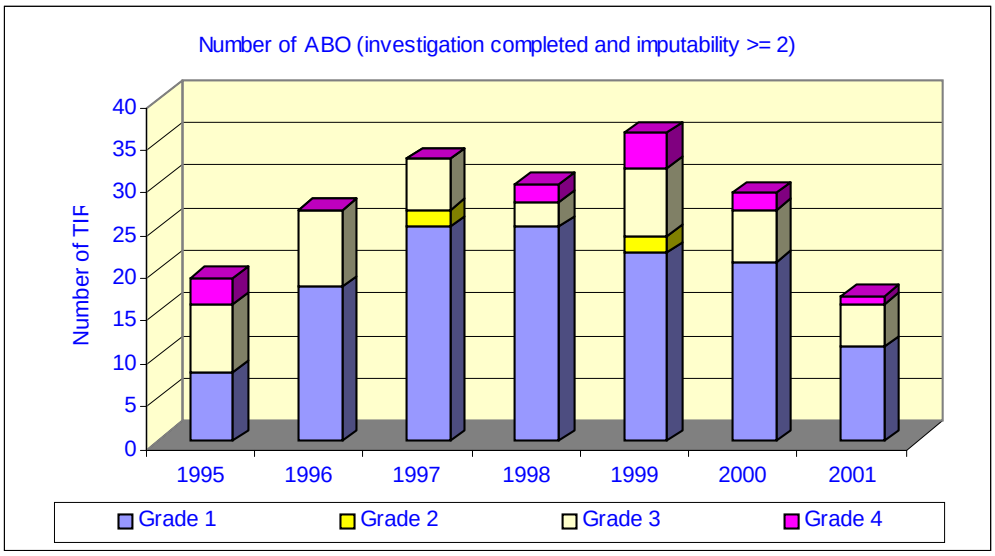
- real decrease...

The large training actions taken by the whole haemovigilance network at the level of all the actors, as well as the systematic analysis and study of each reported incident have probably contributed to such evolution.

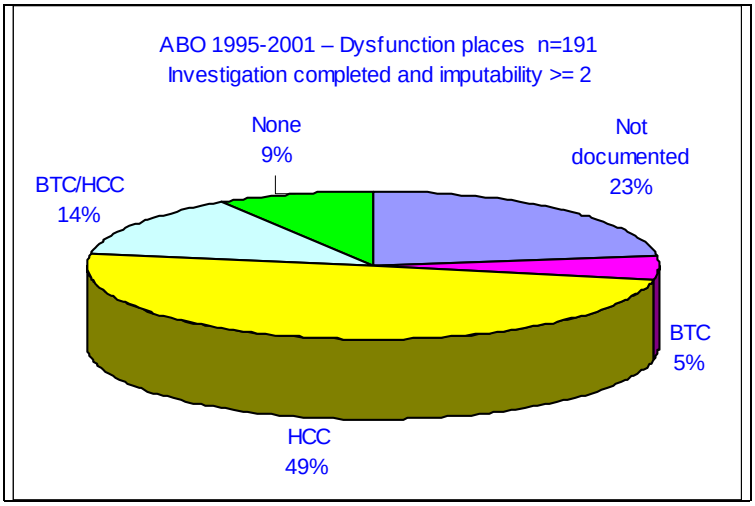
Number of ABO incidents – investigation completed and imputability >=2

Year	1994	1995	1996	1997	1998	1999	2000	2001
Total no. of ABO inc.	16	19	27	33	30	36	29	17
Among which autologous incidents	1		2	3	3	1		1

11 ABO-type incidents were reported with the use of autologous blood products. These incidents seem to follow the same evolution as the rest of ABO incidents. However, their incidence is difficult to assess considering the low total number.



5.2.2.2. Dysfunction places - 1995-2001



The dysfunction place largely remains health care centers, since they are mentioned in 82% of the documented cases. BTC distribution errors are rarely involved by themselves (5%). Furthermore, a specific study on the origin of ABO errors is in the process of being published.

5.2.2.3. 2001 - ABO TI

In 2001, 17 immediate incidents were recorded, for which the *ABO immunologic incompatibility* diagnosis category item was ticked.

Grades – investigation completed and imputability >=2

Imputability	Grade 1	Grade 3	Grade 4	Total
Imputability 2	1	2		3
Imputability 4	10	3	1	14
Total	11	5	1	17

Incriminated products – investigation completed and imputability >=2

Products	Grade 1	Grade 3	Grade 4	Total
RBCC	8	3	1	12
APC		1		1
SD plasma		1		1
Other	3			3
Total	11	5	1	17

Distribution method – investigation completed and imputability >=2

Storage		Nominative allocation: yes	Nominative allocation: no
Medicalized storage: yes	Emergency storage: no	2	1
Medicalized storage: no	Emergency storage: yes		2
Medicalized storage: no	Emergency storage: no	12	

5/17 ABO TI (29%) are related to distribution from a blood storage site. Such characteristic shall also be associated with the notion of distribution in vital emergency condition. The general emergency context may constitute a factor favoring assignment errors, with the drop of security barriers, especially IT barriers (manual distribution frequently found in the comments relative to these incidents).

5.2.3. "Allergy" diagnosis category TI

Definition: allergy is a state of anaphylaxy with a patient who reacts with violence to transfusion. Such phenomenon is the consequence of a conflict between the allergene-resulting antigene (allergic substance), and antibodies.
"Allergy" type incidents are identified with a specific item in the GIFIT database.

5.2.3.1. 1995-2001 Evolution of the number of allergies

Number of Allergies – investigation completed and imputability >=2

Year	1995	1996	1997	1998	1999	2000	2001
Number TI	472	1089	1154	1248	1311	1331	1337

5.2.3.2. 2001 - Allergy diagnosis category TI

A study of the data for 2001 confirms that "allergy" diagnosis category TI are mainly grade 1 incidents and constitute a frequent complication in apheresis platelet concentrate transfusion.

Grades – investigation completed and imputability >=2

Imputability	Grade 1	Grade 2	Grade 3	Grade 4	Total
Imputability 2	391	1	6	2	400
Imputability 3	693	4	13		710
Imputability 4	215	1	11		227
Total	1299	6	30	2	1337

Incriminated products – investigation completed and imputability >=2

Products	Grade 1	Grade 2	Grade 3	Grade 4	Total
RBCC	348	4	5	2	359
APC	817	2	19		838
MCP	55		1		56
Plasma	50		2		52
Other	29		3		32
Total	1299	6	30	2	1337

"Allergy" reactions represent 24.4 % of TI with an imputability >=2 and a completed investigation. The risk is 0.5 for 1000 distributed BC. APC transfusion appears to be the greatest "allergy" type incident risk factor with a ratio of 5.02 incidents for 1000 distributed APC, whereas the ratio is of 2,35 with MCP and only of 0,22 with plasma products and 0,19 with RBCC. Allergic reactions represent a significant part of incidents reported after the use of plasma products, but are quantitatively not so significant though, as much in the form of an absolute value as in that of a ratio for 1000 distributed products.

However, these reactions are mild: 97.2 % of these TI have a seriousness grade of 1. In 2001, only 2 deaths were recorded.

5.2.4. NHFR, Non haemolytic febriles reactions

Definition: TI with non haemolytic febrile reactions are defined as TI where shivering and/or fever and an "unknown" type diagnosis were recorded.
This new category constitute an attempt to carve up the "unknown" diagnosis category in the GIFIT database, in the perspective of a comparison with the haemovigilance data from other systems.

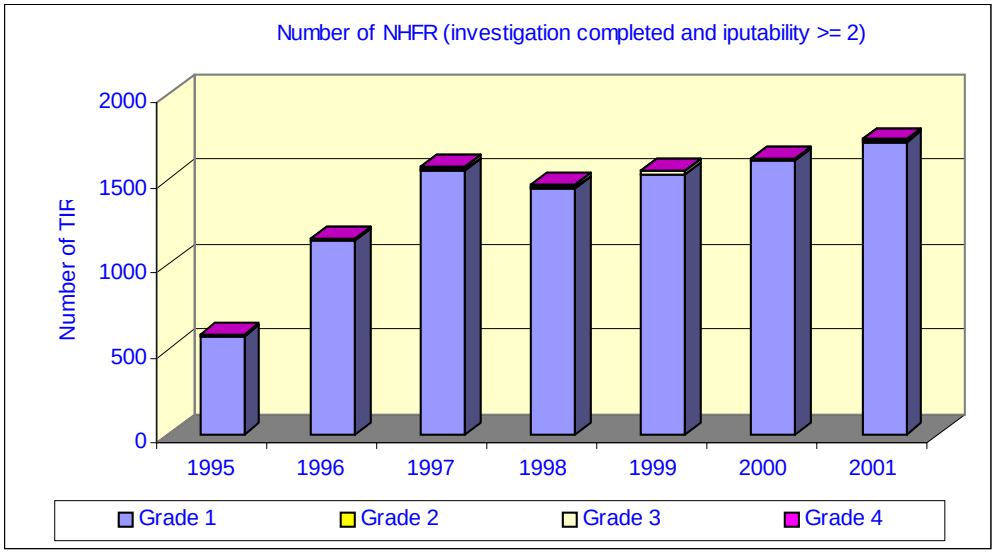
5.2.4.1. 1995-2001 Evolution of the number of non haemolitic febrile reactions

NHFR – investigation completed and imputability >=2

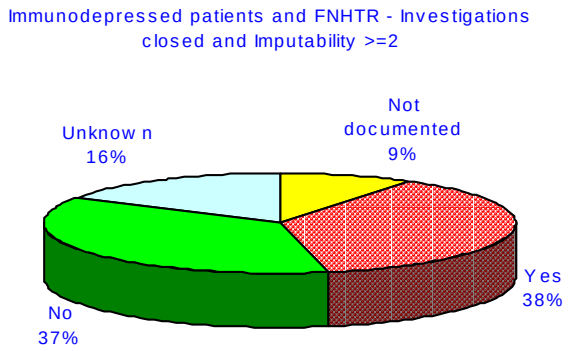
Year	1995	1996	1997	1998	1999	2000	2001
Number of NHFR	584	1154	1577	1474	1553	1628	1735
Number of "unknown" type TI	*719*	*1435*	*1892*	*1854*	*1878*	*1891*	*2032*
NHFR/ "unknown"	81,2%	80,4%	83,4%	79,5%	82,7%	86,1%	85,5%

NHFR are mainly mild accidents– 99% of grade 1 incidents.

As an example, 2 deaths and 14 grade 3 incidents for 1,735 incidents were reported in 2001.



5.2.4.2.NHFR and immunodepressed patients



The patient immunodepression status occurs in 50% of cases where this item is documented. Immuno-depression appears as a factor favoring the occurrence of non haemolytic febrile reactions but a comparison with the status of all transfused patients shall be made.

5.2.4.3. 2001 - TI Non haemolytic febrile reactions

Grades – investigation completed and imputability >=2

Imputability	Grade 1	Grade 3	Grade 4	Total
Imputability 2	1320	10	2	1332
Imputability 3	371	4		375
Imputability 4	28			28
Total	1719	14	2	1735

Most often, they are associated with RBCC and APC. It is estimated that the risk of NHFR is 0.69 for 1000 distributed RBCC and 1.88 for 1000 distributed APC. Therefore, APC transfusion implies a greater risk of NHFR than RBCC tranfusion.

Incriminated products – investigation completed and imputability >=2

Products	Grade 1	Grade 3	Grade 4	Total
RBCC	1355	11	2	1368
APC	307	3		310
MPC	23			23
Plasma products	5			5
Other	29			29
Total	1719	14	2	1735

A progressive increase in the number of transfusion reactions of such type is noted. Together with the decrease in the number of transfused products, and the decrease of some diagnosis category incidents (TIBC, ABO), such evolution can constitute an indicator for the preservation of the incident reporting level and incident right evaluation by correspondents.

5.2.5. TI with positive culture (TIBC)

Definition: TI with positive culture (request made for TIR with positive culture and identification of germs).
This study doesn't concern suspicion cases of bacterial incidents, some of which have not been confirmed, particularly when the culture of the BC proved negative.

5.2.5.1.1995-2001 Evolution of the number of TI with positive culture

TI – investigation completed and imputability >=2

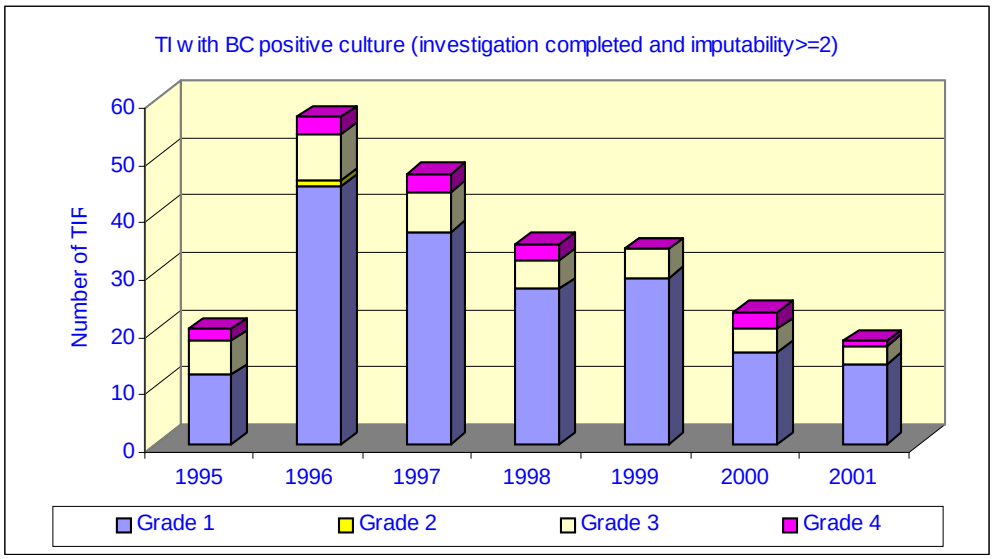
	1995	1996	1997	1998	1999	2000	2001
TIBC suspicions	35	264	58	54	63	41	34
% TI	*1,8%*	*13,7%*	*3,0%*	*2,8%*	*3,3%*	*2,1%*	*1,8%*
Positive culture	20	57	47	35	34	23	18
% TI	*1,0%*	*3,0%*	*2,4%*	*1,8%*	*1,8%*	*1,2%*	*0,9%*
Negative culture	101	585	594	470	478	409	407
% TI	*5,2%*	*30,4%*	*30,8%*	*24,4%*	*24,8%*	*21,2%*	*21,1%*
Culture in progress	2	31	21	18	21	13	9
% TI	*0,1%*	*1,6%*	*1,1%*	*0,9%*	*1,1%*	*0,7%*	*0,5%*
Total	1926	4086	5357	5453	5611	5473	5482

5.2.5.2. 1995-2001 Distribution according to seriousness

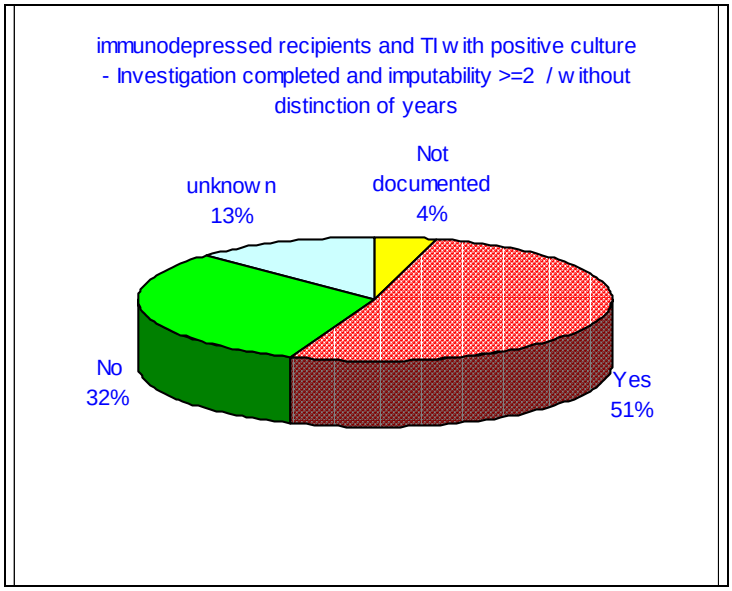
1) A decrease in the reporting of TI with positive culture is observed. However, it is be advisable to check that years 1996 and 1997 do not correspond to concomitant overreporting with 1996-1998 BACTHEM study.

2) There is a high number of grade 1 TI, for which a BC culture is positive. This can be taken as a justification for the notification and investigation of mild transfusion incidents.

3) 0.5 % of grade 1 incidents have a positive BC culture.



5.2.5.3. TI with positive culture and immunodepressed patients

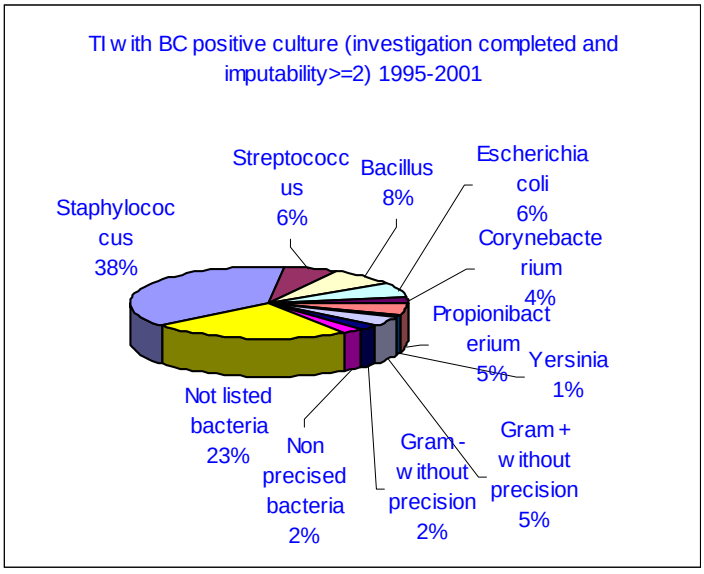


As mentioned in the BACTHEM study, the immunodepression status clearly appears as a factor favoring the occurrence of incidents with product contamination. The immunodepression status is found in 61% of incidents of such type for which the patient status is known.

Transfusion of autologous products doesn't exclude the risk of bacteriological contamination. On the 234 incidents with positive culture of the BC, 8 incidents could be linked with the use of autologous blood products (but stem cells): 1 in 1995, 2 in 1996, 3 in 1997 and 2 in 1999.

5.2.5.4. TI with positive culture – Types of germs - 1995-2001

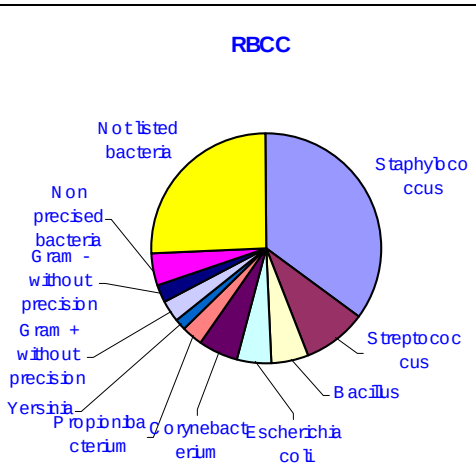
	1995	1996	1997	1998	1999	2000	2001
Staphylococcus	6	24	12	14	11	11	8
Streptococcus	2	3	1	4	3	2	1
Bacillus	4	4	1	2	5	2	2
Escherichia coli	1	6	4		2		1
Corynebacterium	1	1	3	1	3		
Propionibacterium			3	4	1	2	1
Yersinia			1		1		
Gram + without precision	1	2	3	3	1		
Gram – without precision	1	2	2			1	
Non precised bacteria		4	1				1
Unlisted bacteria	4	11	16	7	7	5	4
Total	20	57	47	35	34	23	18

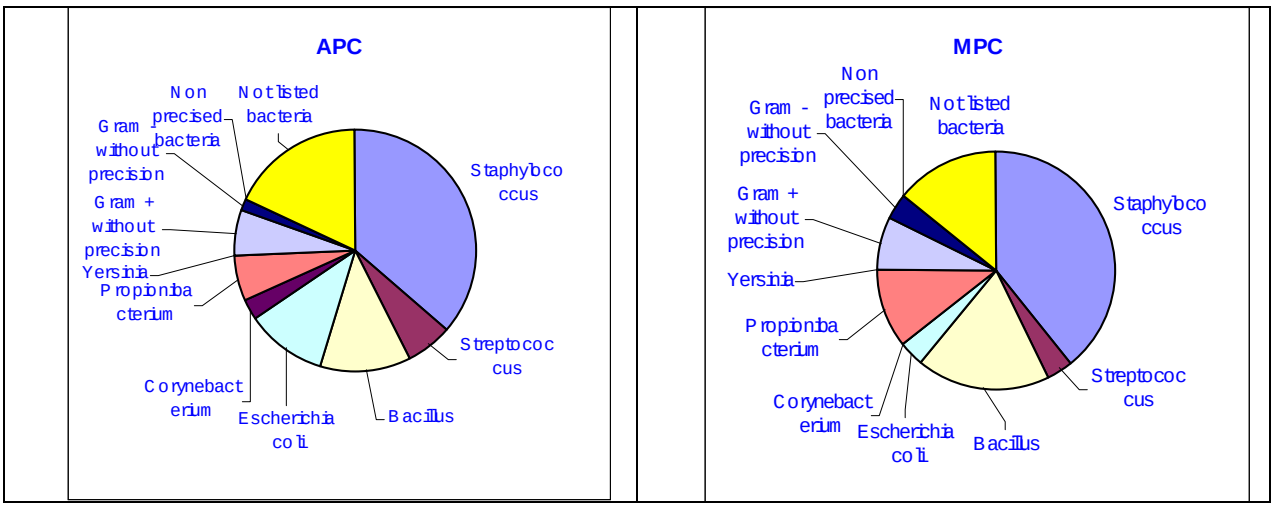


5.2.5.5. TI with positive culture– Types of germs by types of BC

Transfusion incidents with positive culture in 1995-2001 – Investigation completed & Imputability >=2

Analysis of the identified germs comes across, in majority and in a similar manner with all three types of products, the staphylococcus family. The distribution hasn't varied during the 1997-2001 period.





5.2.5.6. 2001 - TI with positive culture in 2001

Grades – investigation completed and imputability >=2

Imputability	Grade 1	Grade 3	Grade 4	Total
Imputability 2	8	1		9
Imputability 3	5		1	6
Imputability 4	1	2		3
Total	14	3	1	18

Germs – investigation completed and imputability >=2

Germes	Grade 1	Grade 3	Grade 4	Total
Staphylococcus	7	1		8
Streptococcus	1			1
Bacillus	1	1		2
Escherichia coli		1		1
Propionibacterium	1			1
Other	4		1	5
Total	14	3	1	18

Incriminated products – investigation completed and imputability >=2

Products	Grade 1	Grade 3	Grade 4	Total
RBCC	9	1	1	11
APC	5	2		7
Total	14	3	1	18

In 2001, half of the identified germs are staphylococcus and in nine cases out of eighteen (50%), the etiological study resulted in a high imputability (grade 3 or 4). In three cases, the responsibility of the germ could be confirmed both in the product and the patient through molecular biology.

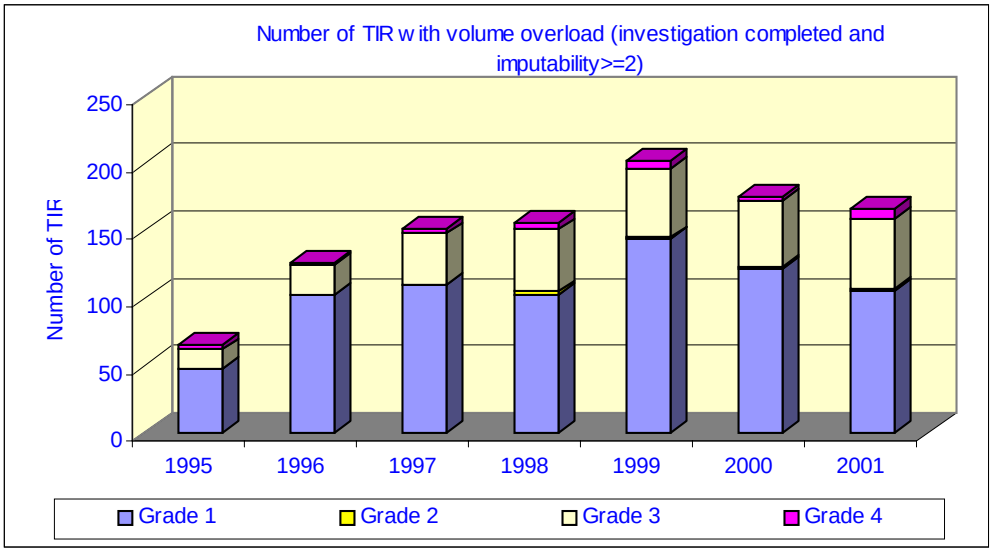
5.2.6. Volume overload

Definition: TI with volume overload as diagnosis category documented on the form.

5.2.6.1. 1995-2001: Evolution of the number of volume overload cases

Number of volume overload cases – investigation completed and imputability >=2

Years	1995	1996	1997	1998	1999	2000	2001
Number TI	66	127	152	156	202	175	166



5.2.6.2. 2001 - TI with volume overload

Grades – investigation completed and imputability >=2

Imputability	Grade 1	Grade 2	Grade 3	Grade 4	Total
Imputability 2	35		14	6	55
Imputability 3	46	1	27	1	75
Imputability 4	25		11		36
Total	106	1	52	7	166

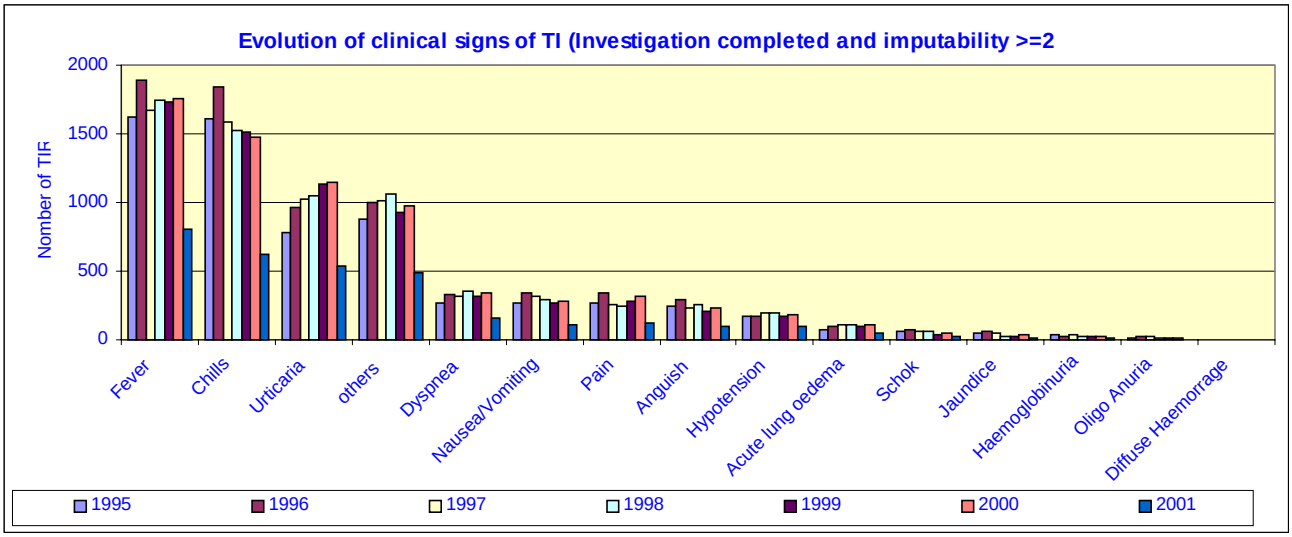
Incriminated products - investigation completed and imputability >=2

Products	Grade 1	Grade 2	Grade 3	Grade 4	Total
RBCC	101	1	47	7	156
APC	3		4		7
Other	2	0	1	0	3
Total	106	1	52	7	166

Accidents due to volume overload remain a frequent and serious complication, mainly related to the use of red blood cell concentrates. In 2001, the vital pronosis was jeopardized in 52 cases (31%) with a high imputability in 73% of cases. Seven deaths were reported, though most of the time with a multiple pathology associated.

5.3. Principal clinical signs

5.3.1. Evolution of clinical signs



5.3.2. In 2001

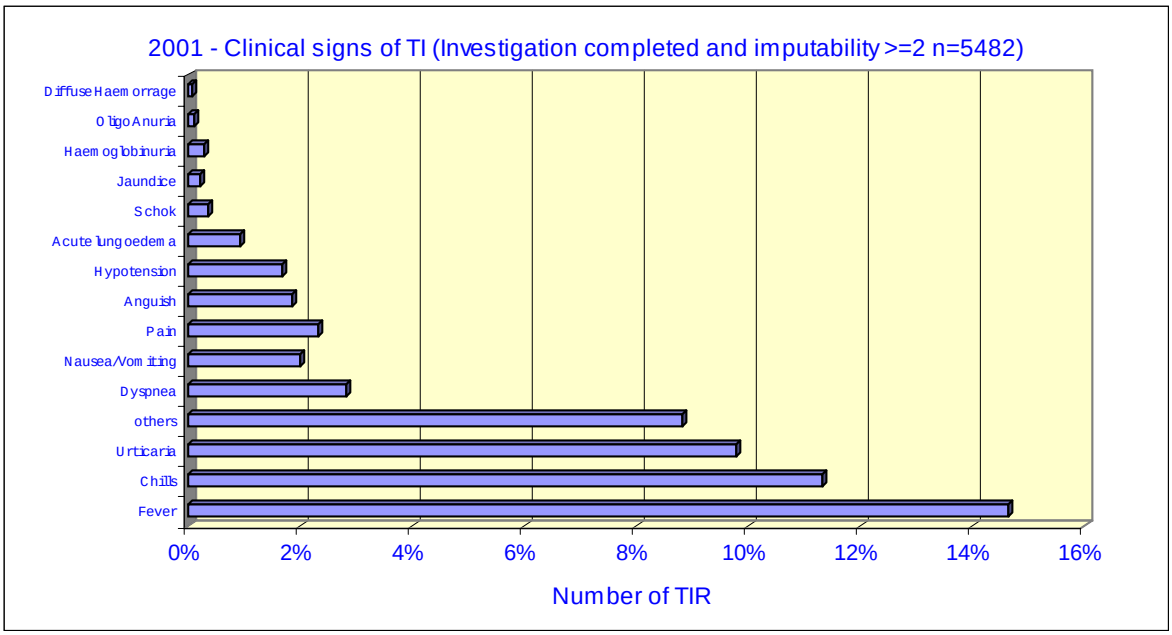
5.3.2.1. Frequency of clinical signs

The most frequent symptomatology is:

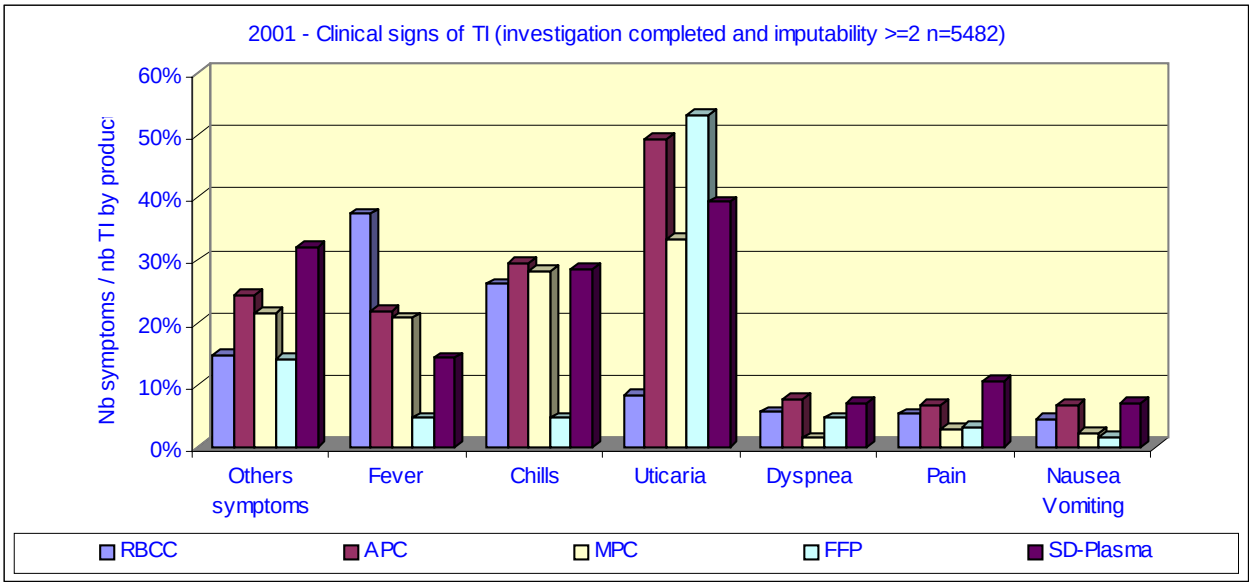
- fever
- shills (or shills-hyperthermia syndrome)
- urticaria
- dyspnea
- nausea/vomiting
- pain...

It is to be mentioned that each of these signs might be the first element of a serious clinical scene:

- the shills-hyperthermia syndrome may be the first sign of an immunologic shock;
- urticaria, anguish or nausea/vomiting may be the first signs of an anaphylactic shock or of bacterial contamination;
- dyspnea may be the first sign of an excessive blood volume;
- pain may be the first sign of an immunologic shock or an anaphylactic shock.



5.3.2.2. Frequency of the principal clinical signs by types of products



The study of clinical signs also contributes to establish a relation with the type of product used. As a result, fever is observed in almost 40% of incidents after transfusion of RBCC, and 53% of the incidents occuring after transfusion of therapeutic plasma products bear clinical signs of urticaria. On the contrary, shivering and fever signs are little present in these incidents after the use of plasma products.

6. CONCLUSION

The first detailed report using the data collected by the Haemovigilance Unit of the Agence française de sécurité sanitaire des produits de santé was made to answer a legitimate request for information feedback towards the haemovigilance correspondents and the whole haemovigilance network. It is neither perfect nor complete, and the remarks and suggestions which will be communicated to us will do nothing but improve reports in the years to come.

Important data are still missing, paticularly the epidemiological and medical denominators of transfused patients. The circumstances of transfusion acts and the health care service environment are also insufficiently explored.

However, up to date, observation has contributed to notice that the French haemovigilance system, set up in 1994 by the Agence française du sang, has partially reached its objectives.

The level of transfusion incident reporting is steady, even though heterogeneity persists from a health care center ot another. Nevertheless, such deviation tends to reduce with the passing years.

It seems there is a modification of the incident diagnosis category profile. The decrease in the number of bacteriological contamination cases and assignment errors is an encouraging element, supported by the stability or even the increase in the reporting of non haemolytic febrile reaction-type mild incidents. To explain this phenomenon, a better awareness campaign towards the nursing personnel, a more attentive exploration of post-transfusion reactions, and why not the benefit gained from the great many training courses which were initiated by all the haemovigilance actors are put forward. The prevention efforts made by blood transfusion centers, at the level of blood collections (donor selection, asepsis), product preparation, or nominative allocation security have certainly contributed for a large part to the reinforcement of transfusion security which we hope to observe.

The maintenance of the high level of quality obtained is subjected to motivation from all the actors, which shall remain intact. These data may therefore be widely used and circulated. They are the haemovigilance network property. The system performance is also subjected to the maintenance of these basis figures. Traceability of labile blood components in France is of 97%. That is good, but also means that 3%, or 72 000 products (the equivalent of the consumption of two medium size UHC) are still not traced in France.

This report is the report of all of us. Then, it is freely exposed to your comments for the improvement of the future issues.