Canadian Blood Services

BLOOD
PLASMA
STEM CELLS
ORGANS
& TISSUES

DIAGNOSTIC SERVICES

ALBERTA

YEAR IN REVIEW

JANUARY – DECEMBER 2018

Diagnostic Services “Year in Review” statistics are based on a January to December calendar year. The calendar year provides better correlation with Health Canada birth statistics.

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PERINATAL LABORATORY

The Perinatal Laboratory within Diagnostic Services at Canadian Blood Services provides diagnostic testing of pregnant women for blood type and red blood cell antibodies. Results from this screening assist physicians, midwives and nurse practitioners in ensuring the appropriate management of a pregnancy for both the mother and baby.

A. Testing Performed

Canadian Blood Services Perinatal Laboratory routinely performs the following tests:

- ABO/Rh blood type
- Screen for red blood cell antibodies
- Antibody Identification
- Antibody Titre
- Phenotyping
- Fetal Bleed Screening Test
- Kleihauer-Betke Test for quantitation of fetal-maternal hemorrhage
- Postnatal Testing

B. Testing Frequency

Mothers – Initial Testing: All women should be tested upon their first prenatal visit.

Mothers – 26-28 Weeks Gestation: All Rh negative women should be retested at 26-28 weeks gestation. Rh positive women should also be retested at 26-28 weeks gestation when there is only one blood group result available (usually first pregnancy) or if patient is at increased risk of allo-immunization (e.g. previous transfusion, Maternal trauma or obstetrical procedure).

Mothers – Antibody Present: If the antibody is known to cause HDFN, it is recommended that specimens be submitted monthly in the first and second trimester and every two weeks in the last trimester. More frequent testing may be indicated if the antibody titre rises rapidly or if clinical monitoring mandates that additional sampling would provide helpful information. Less frequent sampling may also be recommended for antibodies that are unlikely to be clinically significant or in cases where clinical monitoring through fetal Doppler ultrasound has commenced.

Mothers – Postnatal: Following delivery, specimens from the mother and her baby should be tested if the Rh of the mother is unknown, the mother is Rh negative, the mother has a clinically significant antibody or if the baby shows signs of HDFN (i.e. anemia or jaundice). Midwives or hospitals that do not perform transfusion medicine testing should submit specimens to Canadian Blood Services. A fetal bleed screening test is performed if an Rh negative woman delivers an Rh positive baby. The Kleihauer-Betke assay is performed when the mother has a positive fetal bleed screening test.

Newborns (Cords): Cord blood or neonatal specimens must be submitted with the mother's specimen as noted above. ABO/Rh and direct antiglobulin testing is performed on cord or neonatal specimens submitted to Canadian Blood Services. The direct antiglobulin test is performed if the mother has a

clinically significant antibody or on request if the baby shows signs of HDFN (i.e. anemia or jaundice). This is especially important when the mother is Rh negative or when the mother has a clinically significant antibody. If the baby has unexpected anemia or jaundice assessment of the cord blood sample for blood group and DAT may also be helpful.

Partners: When a woman has an antibody capable of causing HDFN, specimens from the partner will be requested for ABO/Rh and antigen phenotyping. This will assist in assessing the probability of the baby being affected by the antibody. Partners' specimens may also be tested to assess Rh Immune Globulin (RhIG) eligibility of Rh negative mothers.

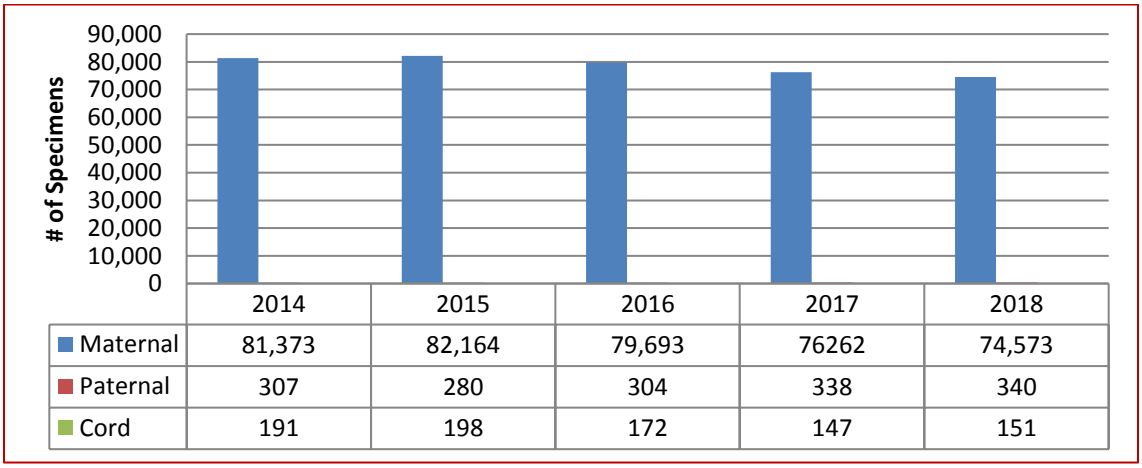
C. Specimens Tested

The data includes all women tested.

Table 1: Perinatal Specimens Tested

Specimen Type	Test Type	2014	2015	2016	2017	2018
Maternal	Type and Screen	81373	82164	79693	76262	74573
Paternal	ABO/Rh	307	280	304	338	340
Cord	ABO/Rh	191	198	172	147	151
Total # of Specimens Tested		81871	82642	80169	76747	75064
Total # of Patients Tested		**67618**	**68657**	**66287**	**63958**	**62221**

Figure 1: Total Perinatal Specimens Tested



Antibodies Identified

In 2018, a total of 500 antibodies were reported (see *Table 2*). This is higher than 2017 where 348 antibodies were reported. Of 500 antibodies identified in 2018, fifty-four (51) women had multiple antibodies. Passive anti-D data has been excluded from the preceding numbers.

Antibodies identified are considered to be clinically significant if they have been reported to cause HDFN. The most common clinically significant antibodies identified were: anti-E, anti-c, anti-D, anti-K, anti-M (IgG), (see *Figure 2*)

which together represented 73% of the total antibodies identified. IgG Anti-M can be considered clinically significant as it may cause HDFN and/or delayed neonatal anemia in rare cases.
Titres for 14 of the clinically significant antibodies increased from non-critical to critical levels during the pregnancy with a total of 33 antibody titres at critical levels (see *Table 3*). Recommendations were made for all patients with a critical titre level (current or previous pregnancy) and all Kell system antibodies to be referred to a High Risk Fetal Assessment Clinic for further follow-up and monitoring during pregnancy.

Table 2: Total Number of Perinatal Antibodies Detected

Maternal Clinically Significant Antibodies Identified 2018					
Antibody	**2014**	**2015**	**2016**	**2017**	**2018**
Anti-D	67	49	58	56	48
Anti-C	31	17	13	20	26
Anti-Cw	1	2	1	0	0
Anti-Ce	0	0	0	0	
Anti-c	59	41	43	43	65
Anti-E	117	91	106	108	150
Anti-e	15	13	6	10	4
Anti-f	0	0	0	0	0
Anti-G	2	3	1	6	6
Anti-K	65	46	53	59	70
Anti-M*	44	37	29	40	52
Anti-S	16	14	7	11	13
Anti-s	1	3	1	1	0
Anti-U	1	1	0	0	2
Anti-Fya	11	18	12	18	12
Anti-Fyb	3	2	0	1	3
Anti-Jka	50	34	18	30	28
Anti-Jkb	6	4	1	2	4
Anti-JK3	1	1	0	0	0
Anti-Lua	2	0	2	0	2
Anti-Lub	1	1	1	0	2
Anti-V	1	0	0	0	0
Anti-Vw	0	0	0	0	0
Anti-Dia	1	1	0	0	0
Anti-Kpa	1	1	0	0	2
Anti-Wra	9	2	5	2	5
Anti-Jsa	0	0	0	1	0
Anti-Mia	0	0	0	2	1
Anti-Joa	0	0	0	0	1
Anti-Yta	0	0	0	0	2
Anti-Mur	0	0	0	0	1
Anti-PP1Pk	0	0	0	0	1
Total	**505**	**381**	**348**	**410**	**500**

*Anti-M – IgG antibody detected

Clinically Insignificant Antibodies	2014	2015	2016	2017	2018
Anti-Lea	20	6	8	12	20
Anti-Leb	1	1	1	1	3
Anti-N	2	1	1	2	1
Anti-P1	0	3	0	1	2
Anti-VS	0	0	1	0	0
Passive Anti-D (not included in total)	1119	633	497	680	555
TOTAL: Clinically Insignificant Antibodies	**32**	**19**	**12**	**27**	**35**

Table 3: Perinatal Patient Antibody Titres (2018)

Antibody	Critical Level	Non-Critical Level	Non-Critical to Critical
Anti-D	16	28	9
Anti-C	0	15	0
Anti-E	6	100	2
Anti-c	3	29	0
Anti-e	0	0	0
Anti-DC	2	3	1
Ant-DE	0	0	0
Anti-Ec	1	10	0
Anti-Ce	0	2	0
Anti-G	0	4	0
Anti-DG	0	0	0
Anti-CG	0	2	0
Anti-Fya	0	9	0
Anti-Fyb	1	3	1
Anti-Jka	1	17	1
Anti-Jkb	0	2	0
Anti-M	3	30	0
Anti-S	0	9	0
Anti-s	0	0	0
TOTAL	**33**	**263**	**14**

Figure 2: Total Number of Perinatal Antibodies (2018)

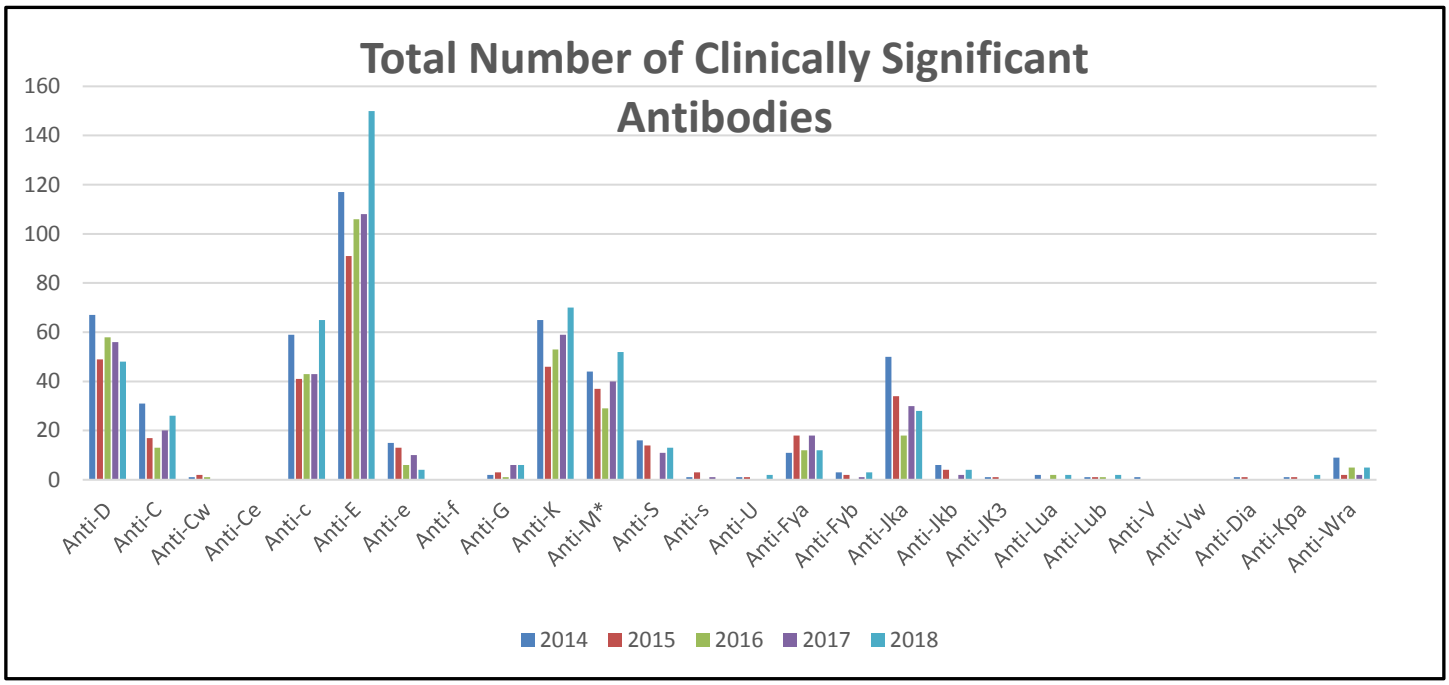


Figure 3: Frequency of Clinically Significant Antibodies (2018)

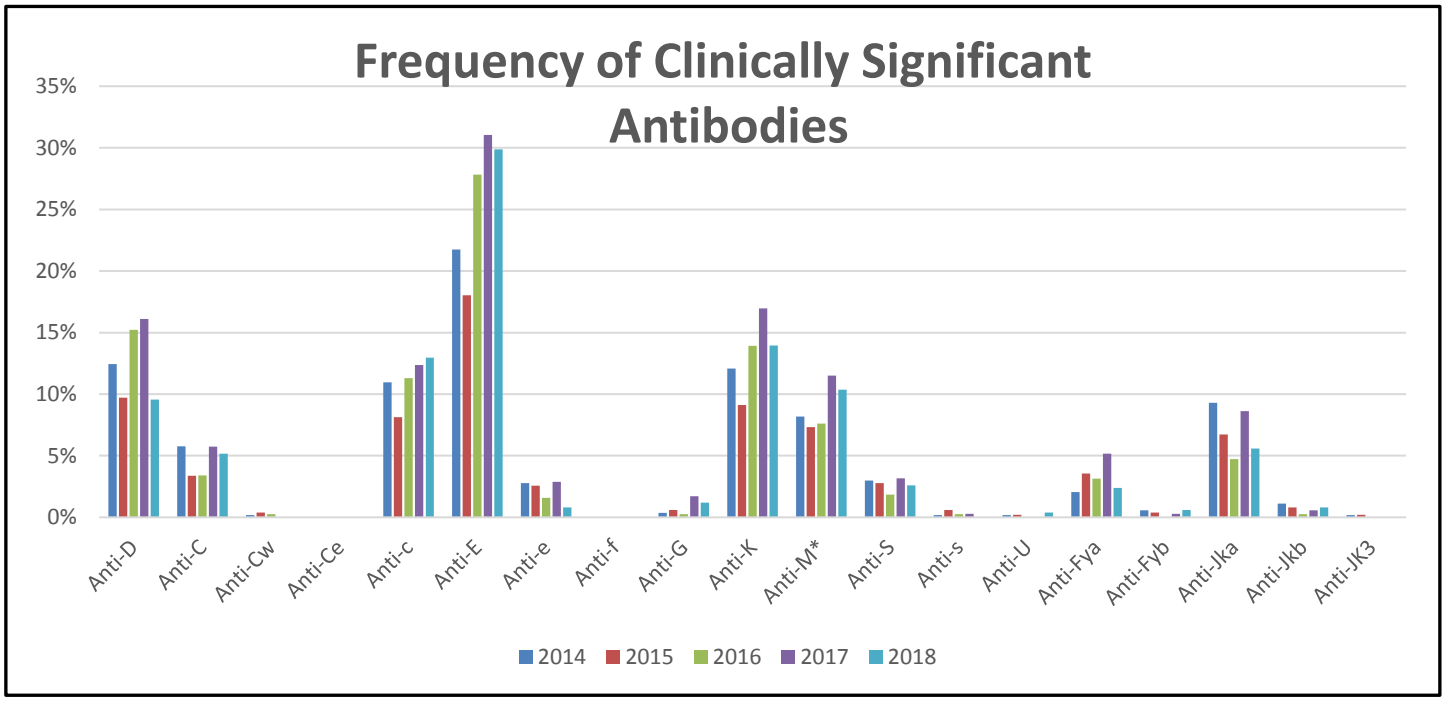


Table 4: Combination Antibodies

Antibodies	Number in 2018
Anti-C, Anti-D	7
Anti-c, Anti-E	9
Anti-C, Anti-e	3
Anti-c, Anti-E, Anti-Jka	1
Anti-c, Anti-G	1
Anti-C, Anti-G	3
Anti-c, Anti-K	2
Anti-E, Anti-Fya	3
Anti-E, Anti-G	1
Anti-E, Anti-Jka, Anti-K, Anti-Wra	1
Anti-E, Anti-K	3
Anti-E, Anti-Lea	3
Anti-E, Anti-S	1
Anti-E, Anti-Wra	2
Anti-Fya, Anti-K	1
Anti-Fya, Anti-Lea	1
Anti-Fya, Anti-Lua	1
Anti-Fyb, Anti-Jkb	1
Anti-Fyb, Anti-K	1
Anti-Jka, Anti-K	1
Anti-Jka, Anti-Wra	1
Anti-K, Anti-Kpa	2
Anti-Lea, Anti-Leb	1
Anti-Mia, Anti-Mur, Anti-S	1

CROSSMATCH / REFERENCE LABORATORY

The Crossmatch/Reference Laboratory within Diagnostic Services provides transfusion medicine services (Crossmatch) for 24 hospitals in central / northern Alberta, 2 in the Northwest Territories and 1 in Nunavut that currently do not routinely perform these tests.

Canadian Blood Services crossmatch repatriation to Alberta hospitals was completed March 31, 2018.

Antibody investigation (Reference) services continue and are provided for hospitals in Alberta, Northwest Territories, northeastern British Columbia and Lloydminster, Saskatchewan. Specimens from these sites are submitted for antibody identification, blood group discrepancy resolution, direct antiglobulin testing, fetal bleed screening and other serological testing.

A. Testing Performed

The Crossmatch/Reference Laboratory routinely performs the following tests:

ABO/Rh blood type
Screen for red blood cell antibodies
Antibody Identification, if antibodies are detected
Crossmatch, electronic and serological (service repatriated to hospitals on March 31, 2018)
Phenotyping (patient and donor units)
Transfusion Reaction Investigation
Direct Antiglobulin Test
Elution and Adsorption
Cold Agglutinin Screen

Antibody Screening is routinely performed by solid phase testing. Combinations of solid phase testing and indirect antiglobulin tube testing using PEG for enhancement are the primary antibody identification methods. PEG IAT is also the manual back-up method for antibody screening.

The Crossmatch Laboratory distributed both stock and crossmatched red cell and other blood components to those hospitals which received all their transfusion medicine services from Canadian Blood Services until March 31. Subsequently the stock of blood components was ordered by hospitals from CBS Distribution.

As a Reference Laboratory, the laboratory performs complex antibody investigations.

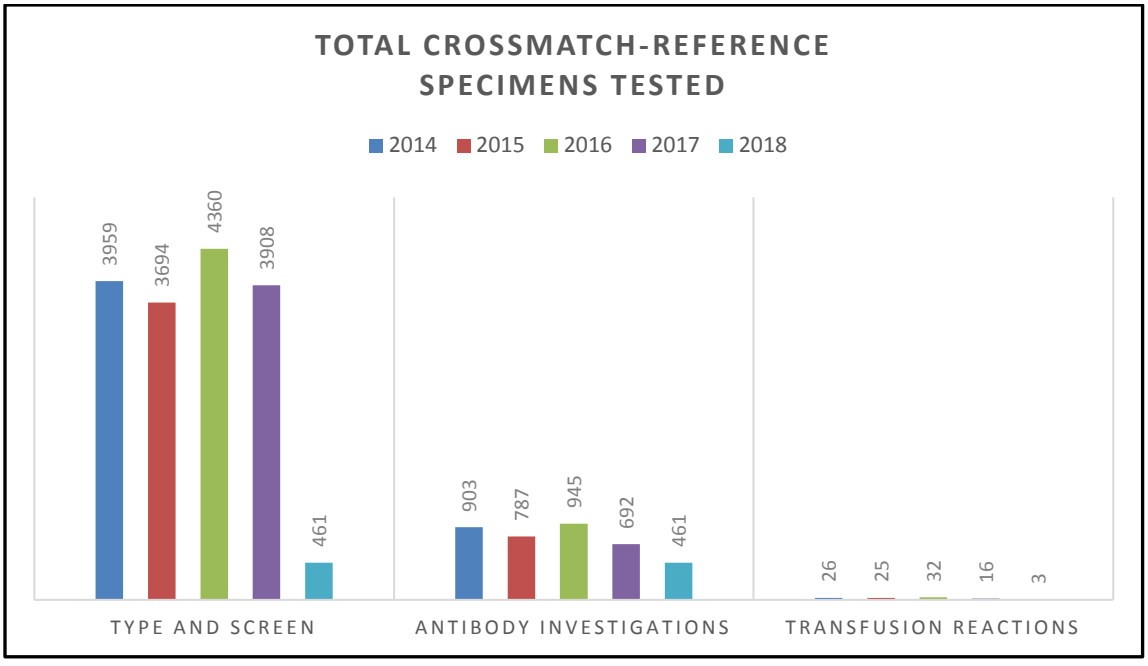
B. Specimens Tested

The data in this report reflects a calendar year period to enable better correlation to other government statistical data. The total number of specimens tested dropped significantly with crossmatch repatriation initiated March 31, 2018 as illustrated in *Table 5* below. There has been a steady decrease in the number of components distributed since 2012 but components issued from crossmatch testing ended as of March 31, 2018.

Table 5: Crossmatch/Reference Specimens Tested

Specimen Type	Test Type	2014	2015	2016	2017	2018
Crossmatch & Reference Jan 1, 2018 to Mar 31, 2018	Type and Screen	3959	3694	4360	3908	559
Crossmatch & Reference Jan 1, 2018 to Mar 31, 2018	Antibody Investigations	903	787	945	692	191
Reference Apr 1, 2018 to Dec 31, 2018		N/A	N/A	N/A	N/A	270
Total Antibody Investigations						461
Jan 1, 2018 to Dec 31, 2018	Transfusion Reaction Investigations	26	25	32	16	3
Jan 1, 2018 to Mar 31, 2018	Blood Components Distributed	6972	6228	6245	5352	582
Test Totals (excluding components distributed)		4888	4506	5337	4616	1484
Number of Patients Tested		2345	2115	2092	1853	772

Figure 4: Total Crossmatch Specimens Tested



C. Antibodies Identified

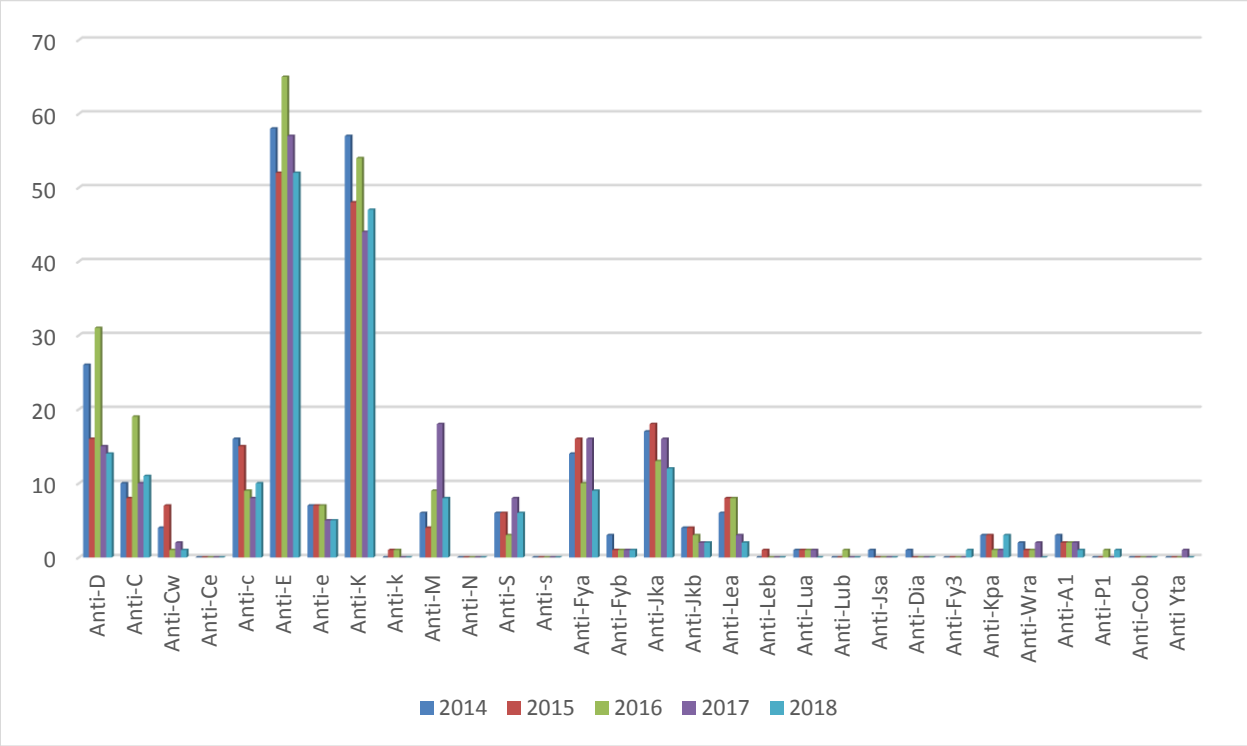
In 2018, a total of 186 antibodies were reported (see *Table 6*). The total number of antibodies detected is 12% lower than in 2017, but the distribution of the most common antibodies remains consistent. One hundred and seventy-seven (177) patients had antibodies identified, and of these, twenty-eight (28) patients had multiple antibodies (16%).

Antibodies identified are considered to be clinically significant if they have been reported to cause acute or delayed hemolytic transfusion reactions. The most common clinically significant antibodies identified were anti-D, anti-C, anti-E, anti-K and anti-Jk[a] (see *Figure 5*) which together represented 77% of the total antibodies identified.

Table 6: Total Number of Crossmatch Antibodies Detected

	2014	2015	2016	2017	2018
Anti-D	26	16	31	15	14
Anti-C	10	8	19	10	11
Anti-Cw	4	7	1	2	1
Anti-Ce	0	0	0	0	0
Anti-c	16	15	9	8	10
Anti-E	58	52	65	57	52
Anti-e	7	7	7	5	5
Anti-K	57	48	54	44	47
Anti-k	0	1	1	0	0
Anti-M	6	4	9	18	8
Anti-N	0	0	0	0	0
Anti-S	6	6	3	8	6
Anti-s	0	0	0	0	0
Anti-Fya	14	16	10	16	9
Anti-Fyb	3	1	1	1	1
Anti-Jka	17	18	13	16	12
Anti-Jkb	4	4	3	2	2
Anti-Lea	6	8	8	3	2
Anti-Leb	0	1	0	0	0
Anti-Lua	1	1	1	1	0
Anti-Lub	0	0	1	0	0
Anti-Jsa	1	0	0	0	0
Anti-Dia	1	0	0	0	0
Anti-Fy3	0	0	0	0	1
Anti-Kpa	3	3	1	1	3
Anti-Wra	2	1	1	2	0
Anti-A1	3	2	2	2	1
Anti-P1	0	0	1	0	1
Anti-Cob	0	0	0	0	0
Anti Yta	0	0	0	1	0
Total	245	219	241	212	186

Figure 5: Total Number of Crossmatch Antibodies



FETAL GENOTYPING

Canadian Blood Services in Alberta refers specimens for fetal genotyping on maternal plasma to the International Blood Group Reference laboratory (IBGRL) of the National Health Services (NHS) in Bristol, United Kingdom. Amniotic fluid samples are rarely sent to the Versiti (formerly Blood Center of Wisconsin) for fetal genotyping. Testing on maternal blood samples is preferred because sample collection does not represent a risk to the fetus.

Specimens are submitted through the Maternal Fetal Medicine clinics in Edmonton or Calgary and are accepted if they meet the following criteria:

- The mother has an antibody capable of causing hemolytic disease of the fetus/newborn (HDFN), AND
- The father is heterozygous for the corresponding antigen (or unknown), AND
- The antibody titre has reached a critical level, OR
- There has been a previous fetus/newborn affected by HDFN, OR
- The antibody is anti-K, OR
- Amniocentesis is being performed for another indication (ie advanced maternal age), even if the mother's antibody titre is at a non-critical level.

Discussion with a Canadian Blood Services physician is required prior to submitting specimens for testing outside of these criteria.

The number of specimens referred for fetal genotyping has ranged between 18 and 24 specimens in recent years.

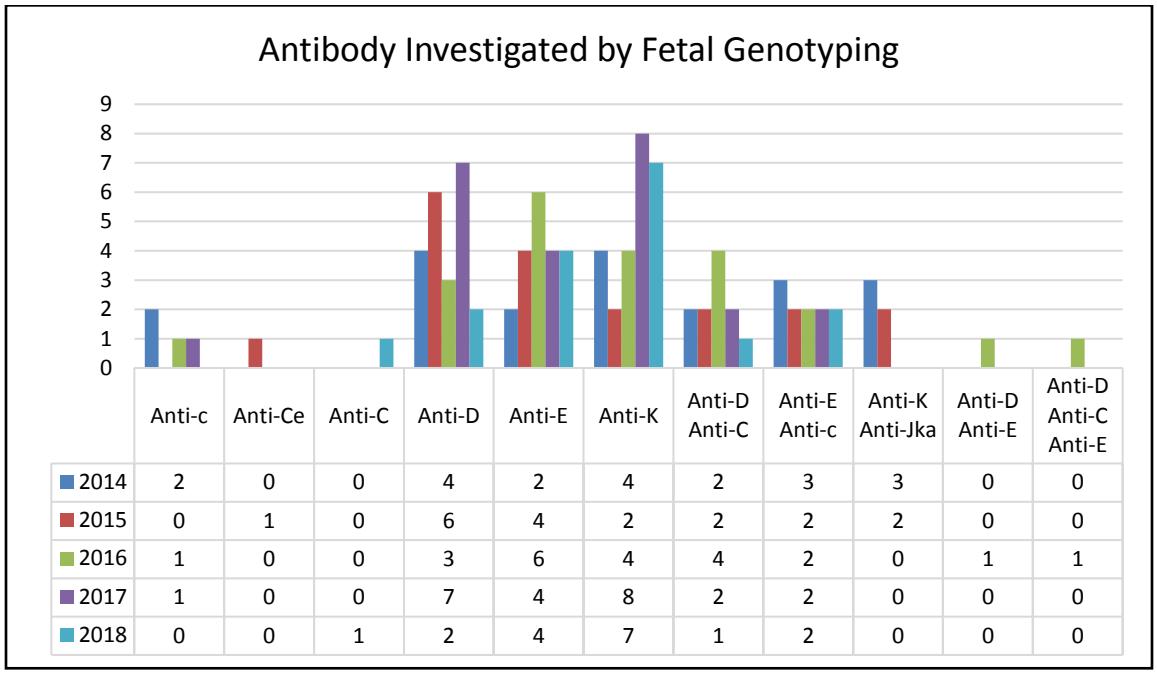
Table 7: Fetal Genotyping Results Summary

	2014	2015	2016	2017	2018
Total samples sent	24	20	23	24	26
# of patients tested	18	17	22	24	21
# of patients not requiring MFM follow-up. (Tested negative for the corresponding antigen)	10	4	9	5	12

Table 8: Fetal Genotyping Results Summary (2018)

Patient	Maternal Antibody	Predicted Fetal Phenotype	Follow-up Required
1	Anti-E	RhE Pos	Yes
2	Anti-K	K Neg	No
3	Anti-E	RhE Neg	No
4	Anti-K	K Neg	No
5	Anti-C	RhC Neg	No
6	Anti-E	RhE Neg	No
7	Anti-K	K Pos	Yes
8	Anti-E, c	RhE- Rhc-	No
9	Anti-K	K Neg	No
10	Anti-D, C	RhC Neg, D inconcl.	Yes
11	Anti-K	K Neg	No
12	Anti-D	RhD Neg	No
13	Anti-D	RhD Pos	Yes
14	Anti-E	RhE Neg	No
15	Anti-K	K Pos	Yes
16	Anti-K	K Neg	No
17	Anti-E	RhE Neg	No
18	Anti-E, c	RhE Pos and c inconcl.	Yes

Figure 6: Total Number of Antibodies Investigated by Fetal Genotyping (2018)

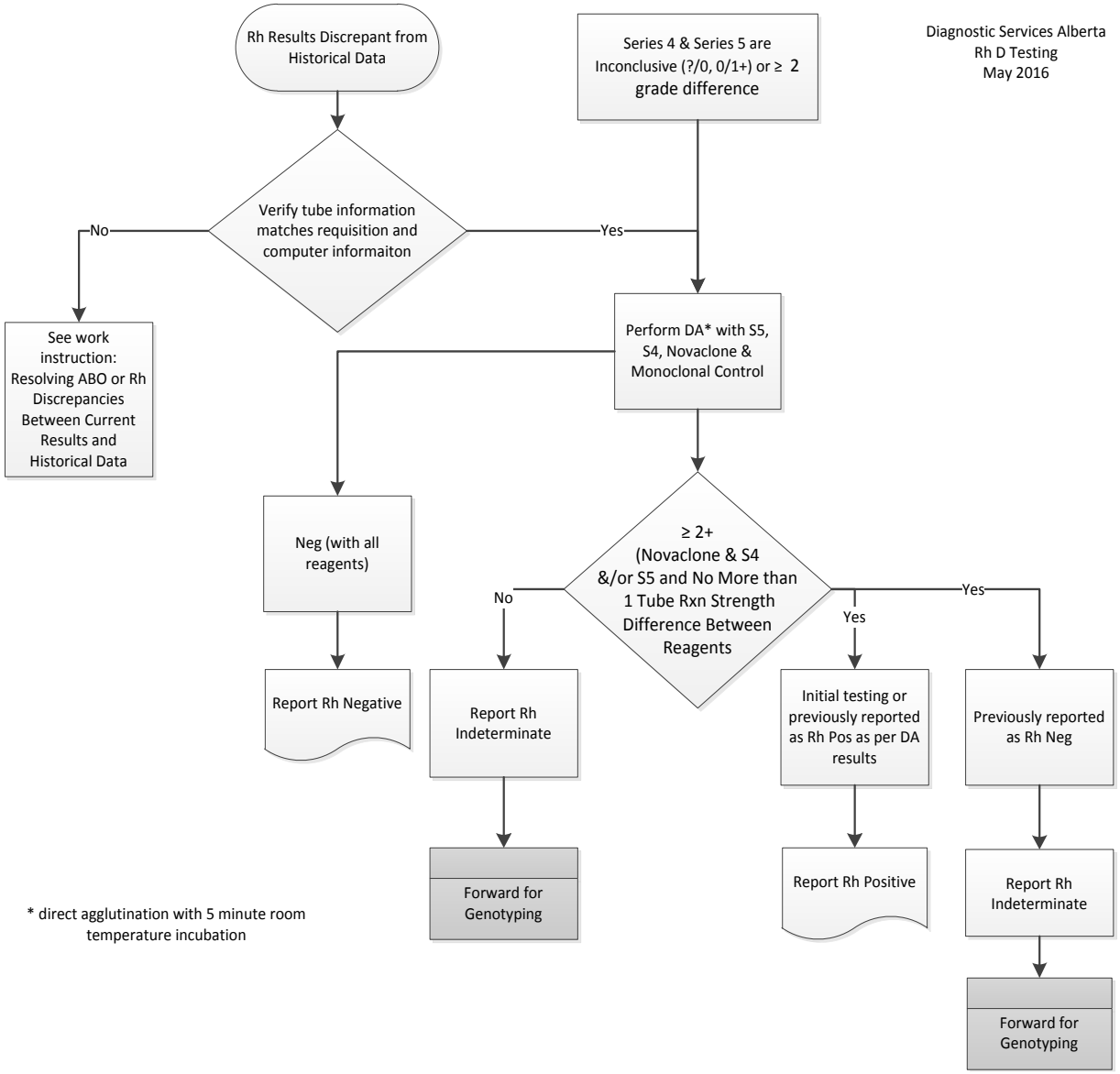


	Anti-c	Anti-Ce	Anti-C	Anti-D	Anti-E	Anti-K	Anti-D Anti-C	Anti-E Anti-c	Anti-K Anti-Jka	Anti-D Anti-E	Anti-D Anti-C Anti-E
2014	2	0	0	4	2	4	2	3	3	0	0
2015	0	1	0	6	4	2	2	2	2	0	0
2016	1	0	0	3	6	4	4	2	0	1	1
2017	1	0	0	7	4	8	2	2	0	0	0
2018	0	0	1	2	4	7	1	2	0	0	0

RHD RED CELL GENOTYPING

Canadian Blood Services in Alberta provides RHD red cell genotyping for facilities in cases where the predicted RhD status of a patient cannot be determined due to discrepant, weak or inconclusive serological RhD testing. The following 2018 testing algorithm was used within Canadian Blood Services laboratories to determine which samples require RHD genotyping.:

Figure 7: RhD Testing Algorithm



The array used for RHD genotyping (Immucor's BioArray BeadChip™ Molecular Assay) is extensive and can detect the most common mutations of the *RHD* gene. The most common variants detected are weak D type 1, weak D type 2 and weak D type 3. Individuals with these phenotypes can be safely treated as Rh positive as it has been well established that they will not form alloanti-D. Patients with any other weak or partial D phenotypes may be capable of forming alloanti-D, and should be treated as Rh negative. When none of the variants present on the array are detected, the software will produce a result of "Possible D". Prior to 2018, it was decided to err on the side of caution, and Canadian Blood Services recommended that patients with a result of "Possible D" be treated as Rh negative. However, based on clinical experience and sequencing studies, it has been confirmed that the vast majority of these patients do not have a mutation of the *RHD* gene. In 2018 the reporting was changed to reflect this and patients with results of "Possible D" were reported as Rh positive individuals.

Figure 8: Number of RHD Genotyping Alleles Detected

The results in Figure 8 were obtained with the *BioArray BeadChip™* genotyping platform.

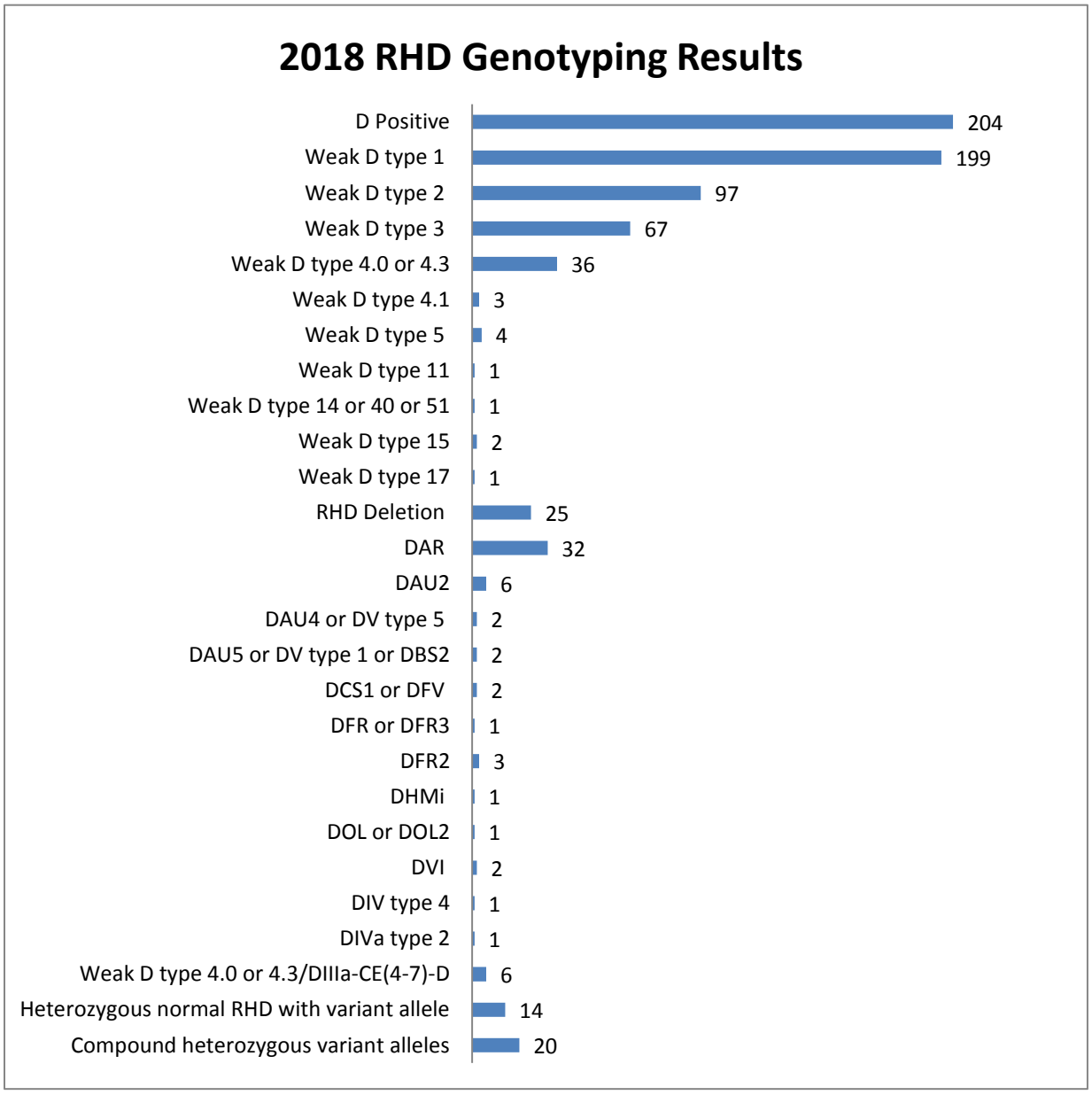
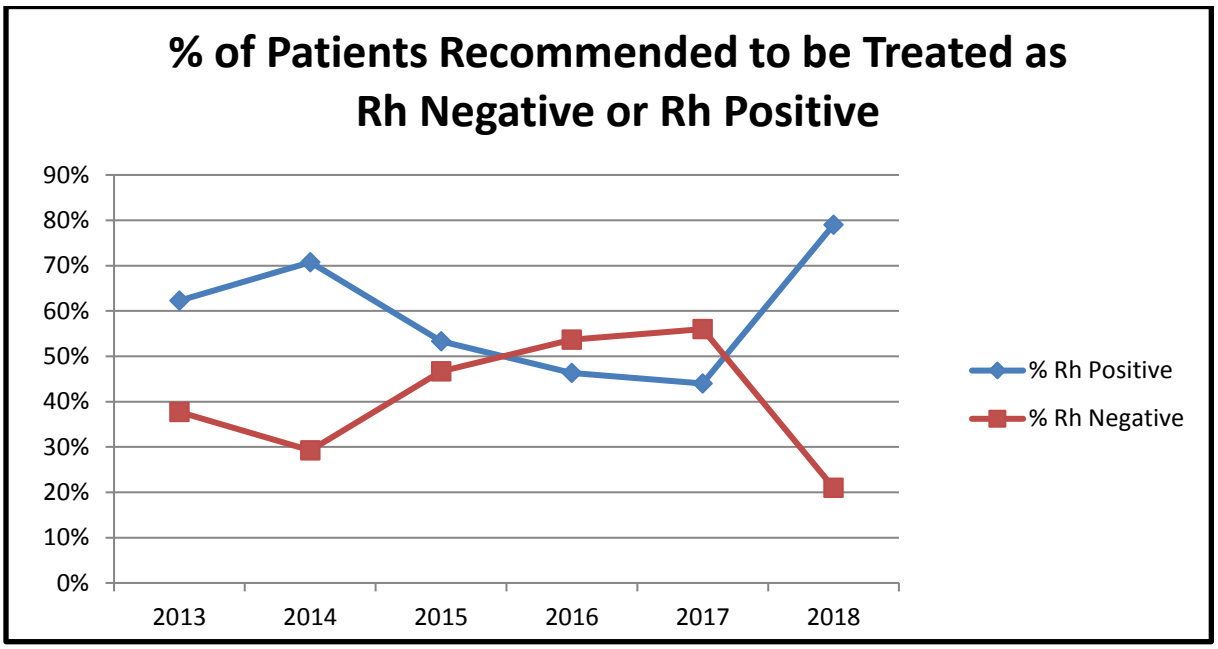


Table 9: RHD Genotyping – Number of Rh Negative and Rh Positive Predicted Phenotypes

	2013	2014	2015	2016	2017	2018
Rh Negative	20	38	175	338	390	153

Figure 9: RHD Genotyping – % Patients Recommended to be Treated as Rh Negative & Rh Positive



QUALITY INDICATORS

The laboratories monitor many quality indicators and the two which are most relevant to this document are turnaround times and rejected specimens which are presented below.

A. Turnaround Times

To ensure timely reporting of patient test results, Canadian Blood Services monitors turnaround time (TAT) from when specimens are received at Canadian Blood Services in Edmonton to the time when the results are available. Since monitoring of this quality indicator began in 2008, the percentage of perinatal specimens has been close to the predefined TAT threshold. The percentage of crossmatch/reference specimens has consistently met the predefined TAT threshold. Samples whose testing failed to meet expected TATs are usually those where clinically significant antibodies are detected or where difficulty in finding compatible blood is encountered.

Table 10: Turnaround Time – Routine Criteria by Specimen Type

Specimen Type	Expected Turnaround Time	Expected % of Specimens Which Meet or Exceed Expected TAT
Routine Perinatal	72 hours	85%
Routine Crossmatch	24 hours	85%
Reference Testing	72 hours	85%

Table 11: Turnaround Time – Perinatal Routine TAT

Turnaround Time (TAT)	2014	2015	2016	2017	2018
% of Specimens Tested within 72 hours	84%	85%	84%	77%	88%
% of Specimens Tested > 72 hours	16%	15%	16%	23%	12%

Figure 10: Perinatal Routine TAT

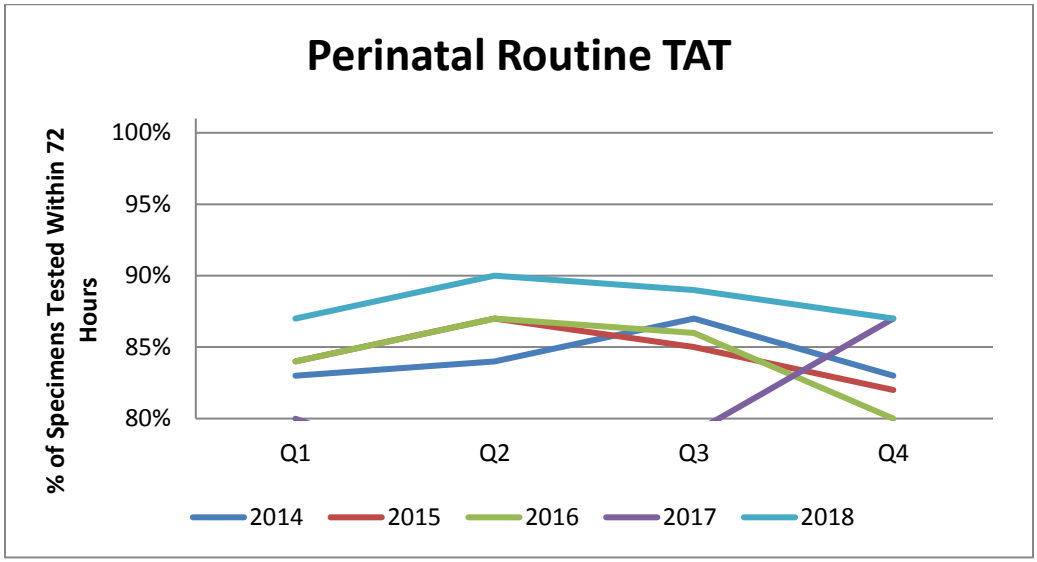


Table 12: Turnaround Time – Routine Crossmatch Specimens

Turnaround Time (TAT)	2014	2015	2016	2017	2018
% of Specimens Tested within 24 hours	99%	99%	99%	99%	99%
% of Specimens Tested > 24 hours	2%	1%	1%	1%	1%

Figure 11: Crossmatch Routine TAT

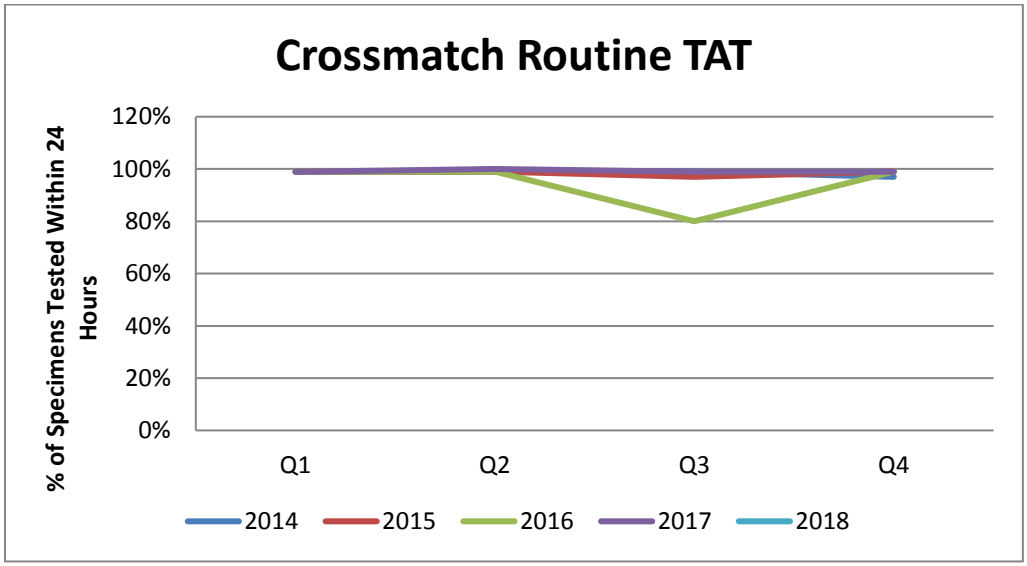
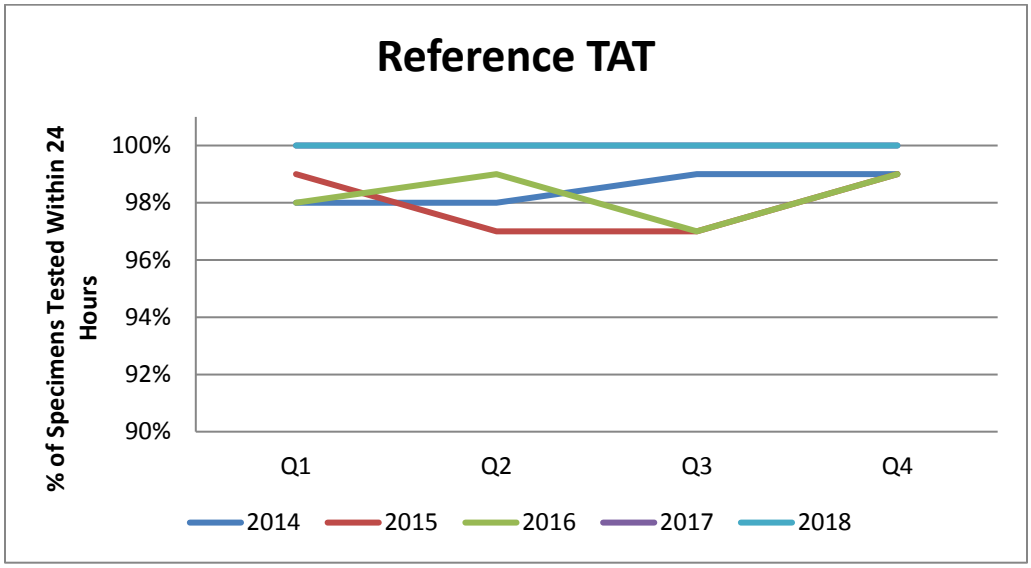


Table 13: Turnaround Time – Reference Specimens

Turnaround Time (TAT)	2014	2015	2016	2017	2018
% of Specimens Tested within 72 hours	99%	98%	98%	99%	100%
% of Specimens Tested > 72 hours	1%	2%	2%	1%	0%

Figure 12: Reference TAT



B. Rejected Specimens

Each time a specimen is rejected, a reason for rejection is entered into our Laboratory Information System. This data is then retrieved and analysed on a quarterly basis. The number of rejected specimens is quite low for crossmatch/reference samples which are coming from hospitals and for perinatal samples which are primarily collected at community collection sites. The Diagnostic Services Laboratory is following the provincial specimen rejection guidelines for Alberta.

The reasons for rejecting specimens in the crossmatch/reference and the perinatal laboratories are somewhat different. More crossmatch specimens are rejected because of problems with the requisition missing critical information such as the blood bank identification number, PHN or phlebotomist signature.

For perinatal specimens, the most common reasons for rejecting a sample for testing are patient identification labelling errors and duplicate requests for testing (duplicate specimens). Testing requests are rejected if another sample from the patient was tested within the previous 96 hours. Often a duplicate test request sample is collected when the patient has seen their family physician and then sees their obstetrician shortly after. We do ensure that the report from the initial testing is sent to the second physician making the request. Health care professionals can access Canadian Blood Services reports for Alberta patients on Netcare, Alberta's Electronic Health Record.

Table 14: 2018 Quarterly Rejection Rates – Perinatal Specimens

Rejection Category	Q1	Q2	Q3	Q4
Requisition	20	18	14	28
Specimen	42	55	130	48
Discrepancies Between Requisition & Specimen	10	15	13	17
Discrepancies Between Current Requisition & Historical Records	0	0	0	0
Other (Duplicates, etc.)	12	5	18	1
Total # specimens rejected	**84**	**93**	**175**	**94**
Total # specimens received	**18369**	**17920**	**18607**	**17651**
Rejections as a % of total	**0.5%**	**0.5%**	**0.9%**	**0.5%**

Figure 13: Perinatal Rejection Reasons (2018)

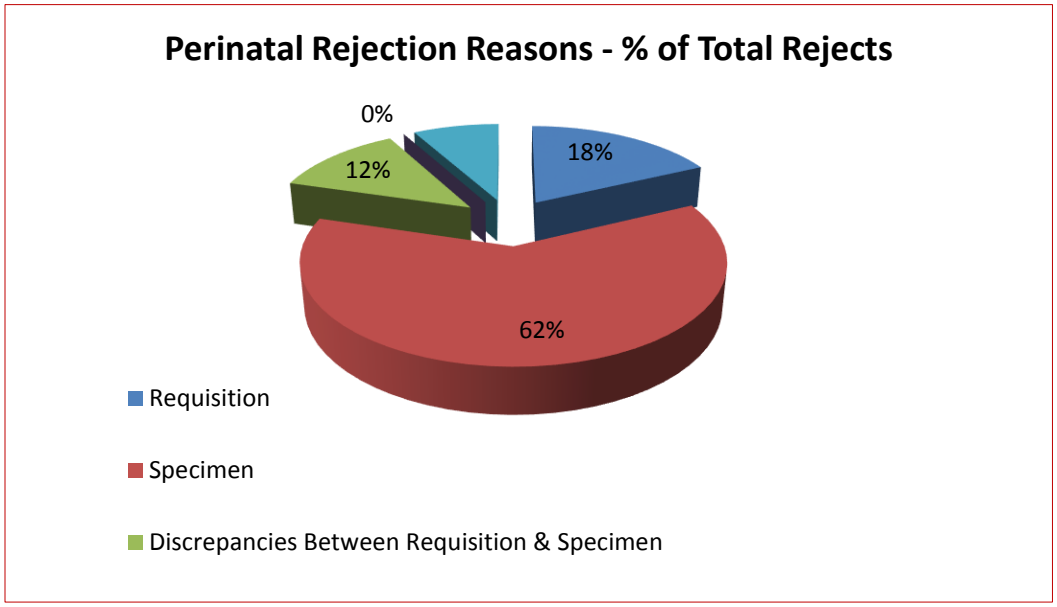
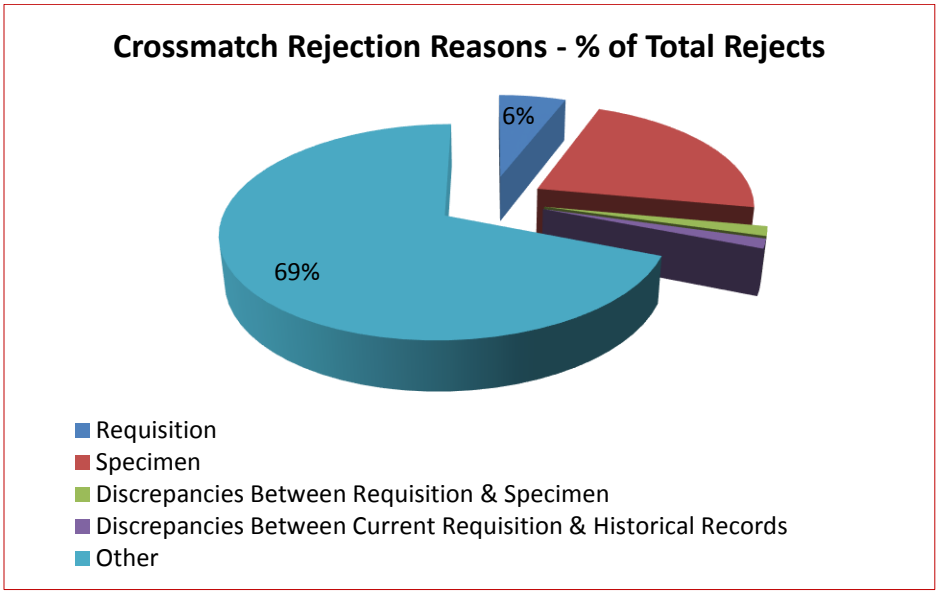


Table 15: 2018 Quarterly Rejection Rates – Reference / Crossmatch Specimens

Rejection Category	Q1	Q2	Q3	Q4
Requisition	1	0	1	2
Specimen	6	1	3	5
Discrepancies Between Requisition & Specimen	1	0	0	0
Discrepancies Between Current Requisition & Historical Records	1	0	0	0
Other (Duplicates, etc.)	8	9	24	6
Total # specimens rejected	**17**	**10**	**28**	**13**
Total # specimens received	**755**	**189**	**189**	**377**
Rejections as a % of total	**2.3%**	**5.3%**	**14.8%**	**3.4%**

Figure 14: Crossmatch Rejection Reasons



ACCOMPLISHMENTS IN 2018

A. Perinatal Advisory Committee

The PNAC continues to collaborate throughout the year and at an annual November meeting. In 2018 several initiatives were finalized including a strategy for automated testing of passive anti D on the NEO analyzer, a standardized and updated investigation algorithm for patients with weak serological reactivity with anti D reagents and a standardized algorithm and repeat testing strategy for prenatal patients with anti M. These initiatives will be implemented in early 2019 with the final versions of the new Work Instruction format at all CBS perinatal testing labs.

The group reviewed and discussed recent national and international guidelines concerning recommendations for testing all prenatal patients with a repeat antibody investigation in mid pregnancy. Cost estimates were presented along with the calculated rate of new antibodies in this prenatal population. The group agreed to additional studies and collaboration with hospitals related to risks of antibody development in this group – possibly with feedback to the SOGC group based on the results. Additional research and collaboration regarding a change in titration strategy to include titration of multiple antibodies as combined titers was also planned – with prospective studies to proceed in the future.

PNAC had a wide-ranging discussion related to the investigation strategies for referral samples. Ongoing work over the coming year will include concentrated efforts to update and standardize work instructions and to continue with plans for integrating NIRL (National Immunohematology Reference Laboratory) donor and patient testing into the Brampton antibody investigation laboratory.

B. Revised Diagnostic Services Web Pages

All Diagnostic Services sites (Vancouver, Edmonton, Regina, Winnipeg, and Brampton) and National Immunohematology Reference Laboratory (NIRL) collaborated in a project to redesign and refresh the current Diagnostic Services webpages on www.blood.ca. The new "Laboratory Services" webpages features includes (Test Catalogue and Quick Links) and information to make the site more user friendly for hospital customers. The new web-section https://blood.ca/en/hospital-services/laboratory-services launched June 25, 2018.

C. **Crossmatch Re-patriation (North Zone)**

Crossmatch testing performed by Edmonton Diagnostic Services Laboratory for North Zone non-testing sites was repatriated back to Alberta Health Services on March 31, 2018. There was no impact to perinatal, referral or genotyping programs.

D. Presentations / Abstracts / Publications (2017-2018)

- J. Hannon, G. Barr, T. Dolnik, L. Ciurcovich, T. Alport, G. Clarke. ***Summary of Cell-Free Fetal DNA (cffDNA) Testing in Pregnant Women in Western Canada.*** Poster/Abstract presented at CSTM (Canadian Society for Transfusion Medicine). April 20 – 23, 2017.
- J. Hannon, G. Barr, T. Dolnik, L. Ciurcovich, T. Alport, G. Clarke***. An Approach to Ensuring Quality in Cell-Free Fetal DNA (cffDNA) Testing.*** Poster/Abstract presented at CSTM (Canadian Society for Transfusion Medicine). April 20 – 23, 2017.
- G. Barr, L. Ciurcovich, T. Dolnik, R. Fallis, L. Grabner, J. Hannon, T. Ison. ***Anti-G Testing and Titration Strategy in Prenatal Patients.*** Poster/Abstract presented at CSTM (Canadian Society for Transfusion Medicine). April 20 – 23, 2017.
- Chan B, Maguire A, Stepien J, To L, Nahirniak S, Hannon J, Lagrange C, Richardson T, Clarke G. ***Optimizing Phenotyped Blood Inventory in Alberta Rural Hospitals.*** Poster/Abstract presented at Labcon Annual Conference, Banff, Alberta May 26 – 28th, 2017.
- AB Diagnostic Services contributes to continuing technologist education at provincial or national transfusion medicine conferences.

GOALS FOR 2019

A. *MMA* testing

When serologically compatible red blood cells are not available for a patient with several or rare alloantibodies, the *Monocyte Monolayer Assay (MMA)* can help predict the survival of serologically incompatible red blood cells in vivo. Canadian Blood Services will be determining the feasibility of implementing the *MMA* in Edmonton, and the potential of offering it as referral test to transfusion medicine clinicians and facilities. A thorough assessment of the methodology and required equipment and reagents will be performed, and the viability of this project will be determined.