



Managing Ontario and Canada's Precious O Rh Negative Red Blood Cell Supply

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ORBCoN Transfusion Committee Forum
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Disclosure

- I have no conflict of interest with this event because I have no affiliations, sponsorships, honoraria, monetary support or conflict of interest from any commercial source
- I am an employee of Canadian Blood Services



Objectives

- To describe the current issues of O-Rh negative red cells
- To explain the challenges with the current supply of O-Rh negative red cells
- To identify strategies to increase the supply of O-Rh negative red cells
- To identify strategies to decrease the demand for O-Rh negative red cells



Demand for red cells

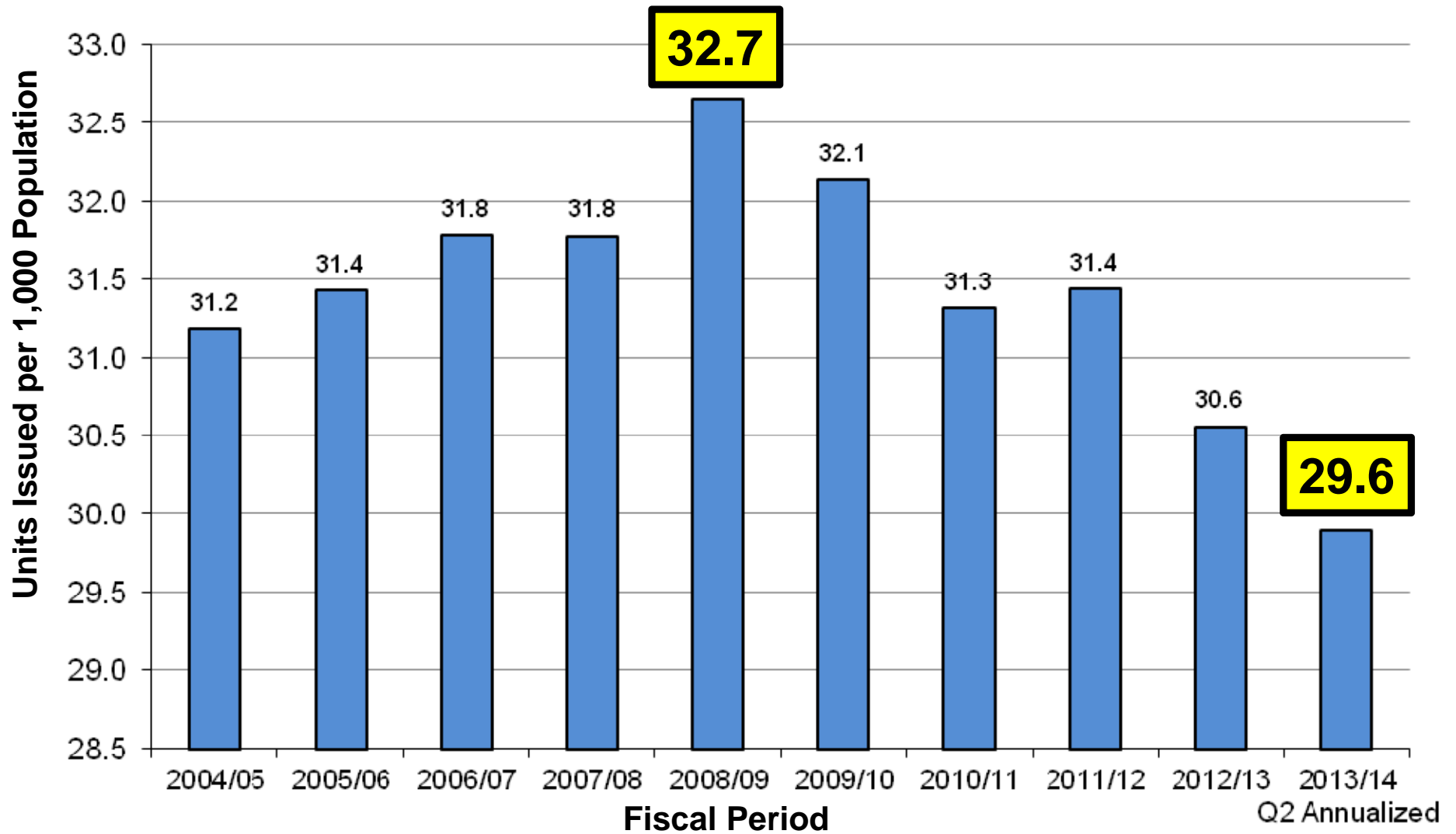
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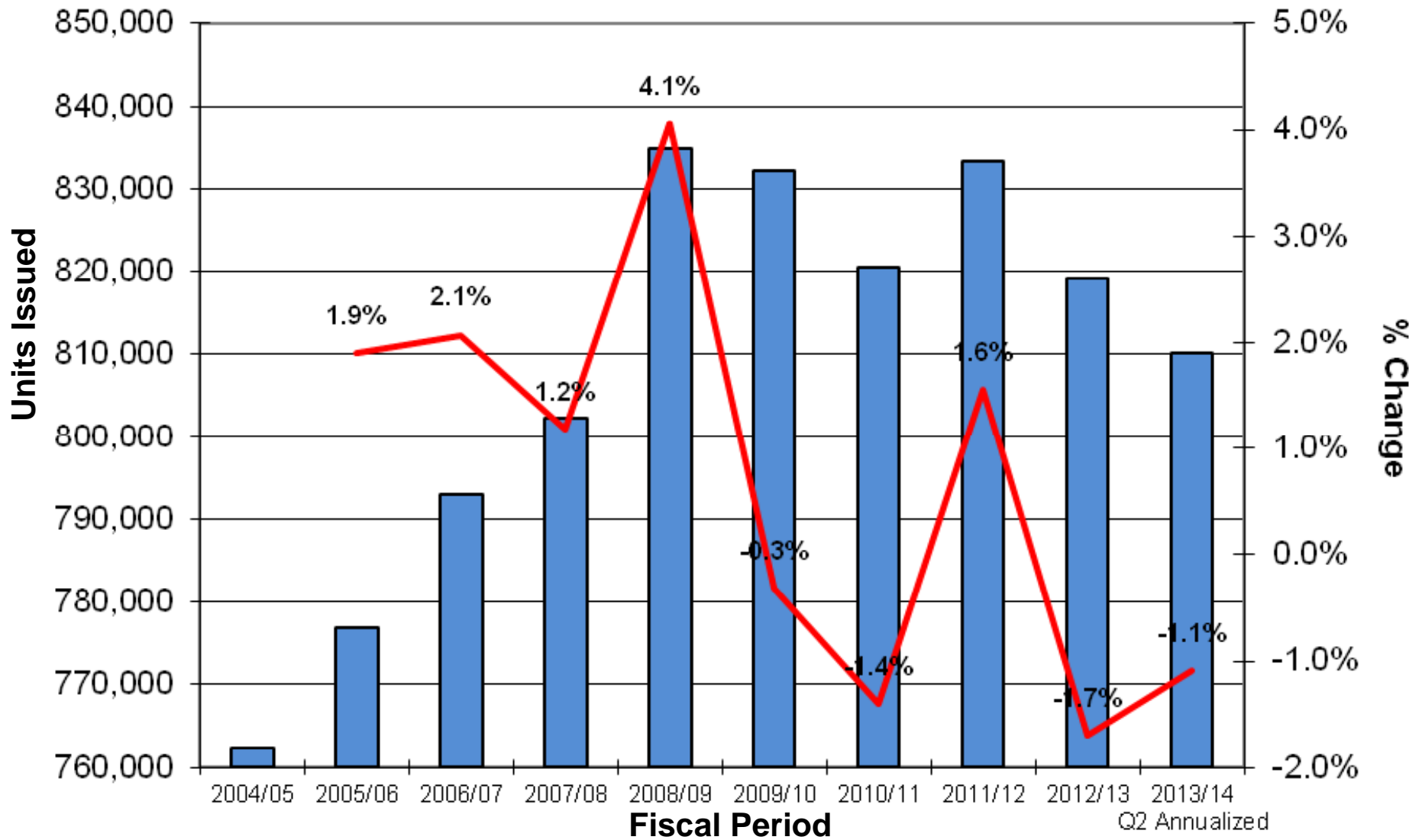
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RBC Units Issued (per 1,000 Population)



Source: CBS internal distribution data. Represents ~75% of Canadian supply

RBC Units Issued (Total and Growth Rates)



Source: CBS internal distribution data. Represents ~75% of Canadian supply

Factors Likely Influencing Red Cell Utilization in Canada

- Increased focus on blood conservation strategies
- Development of Provincial Blood Coordinating offices
- Changing hospital practice
 - Use of electronic crossmatch
- Changing paradigm of transfusion as a medical therapy
- Medical innovations



Demand for O- negative red cells

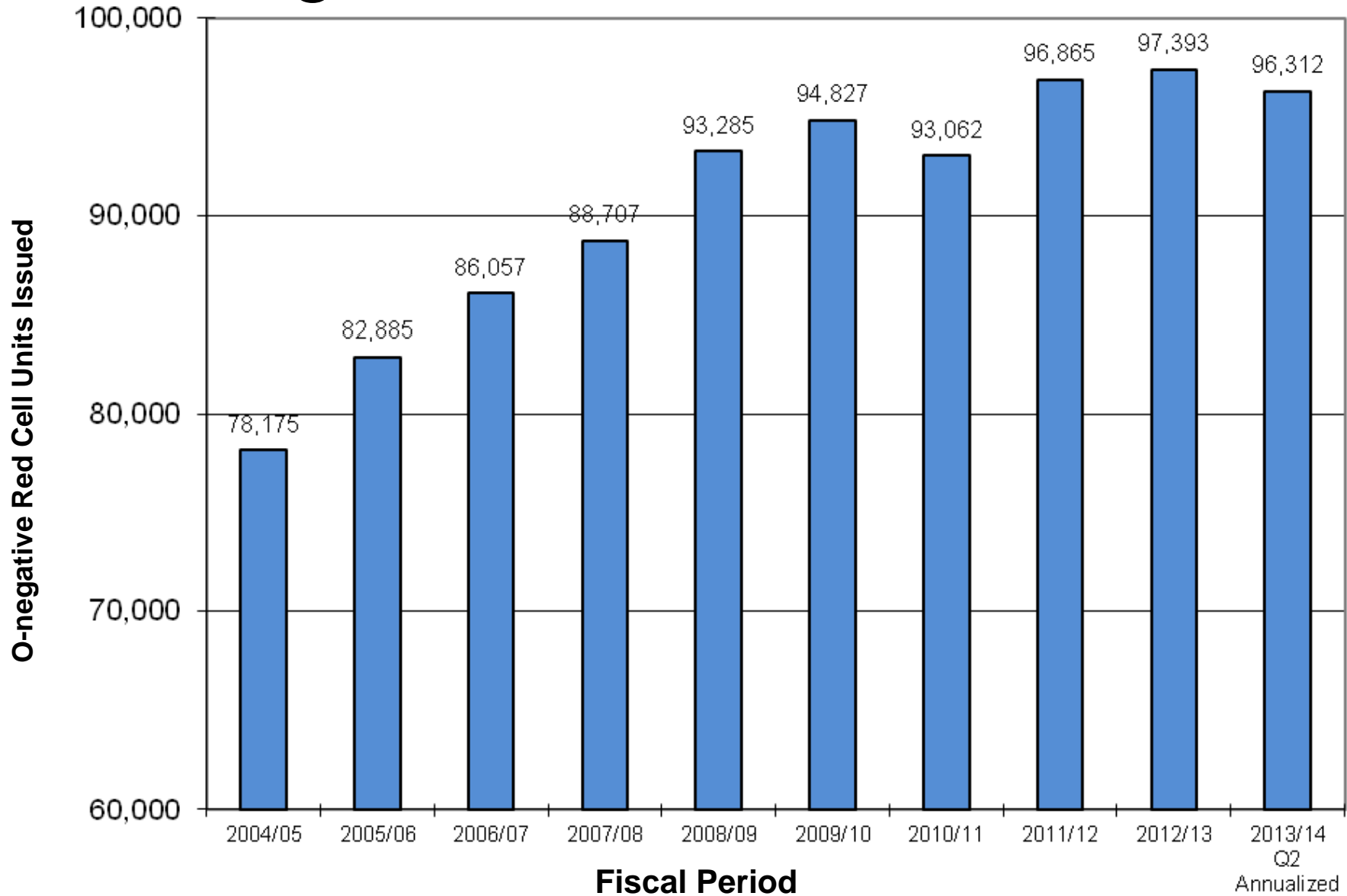
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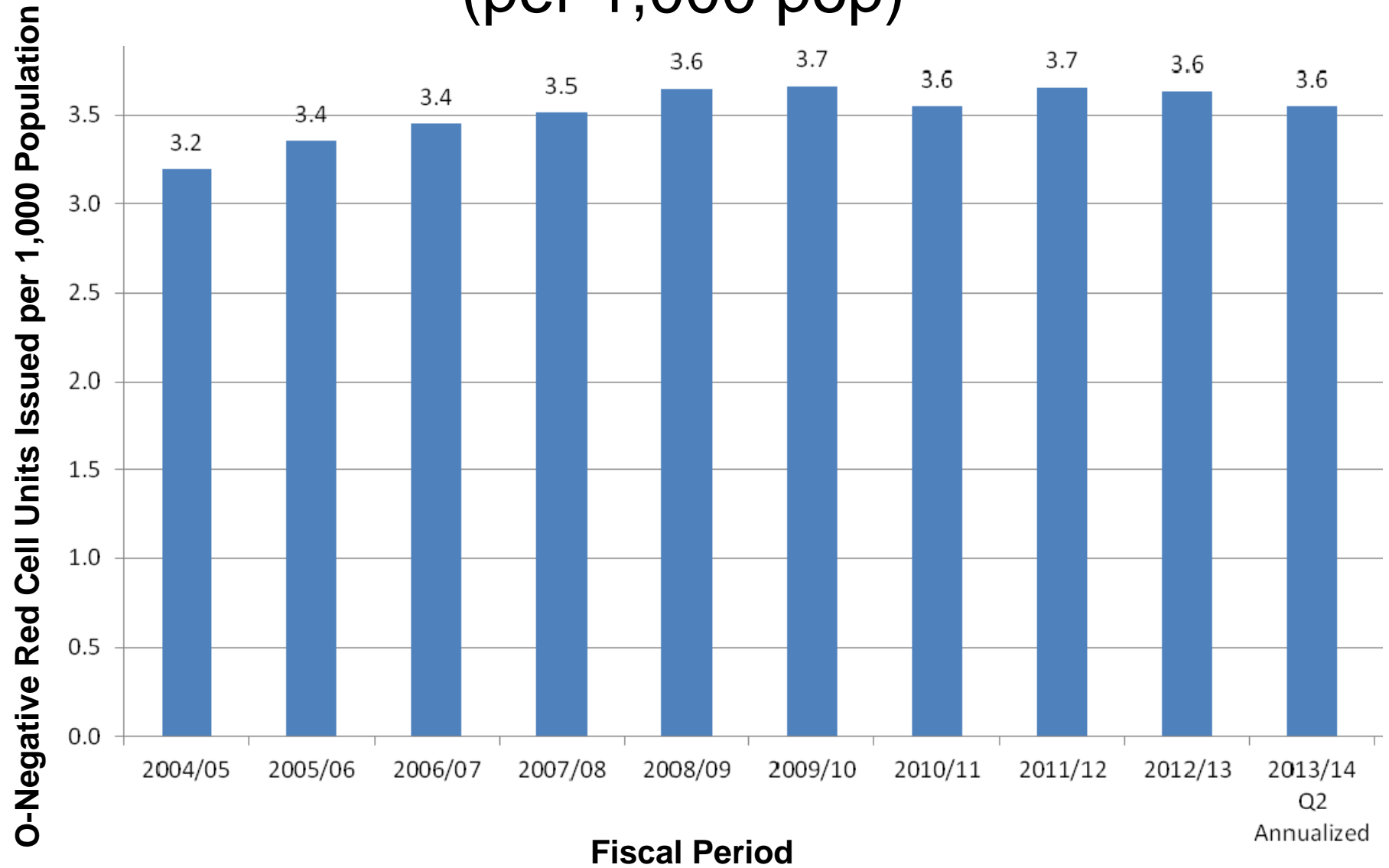
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O-negative Red Cell Units Issued



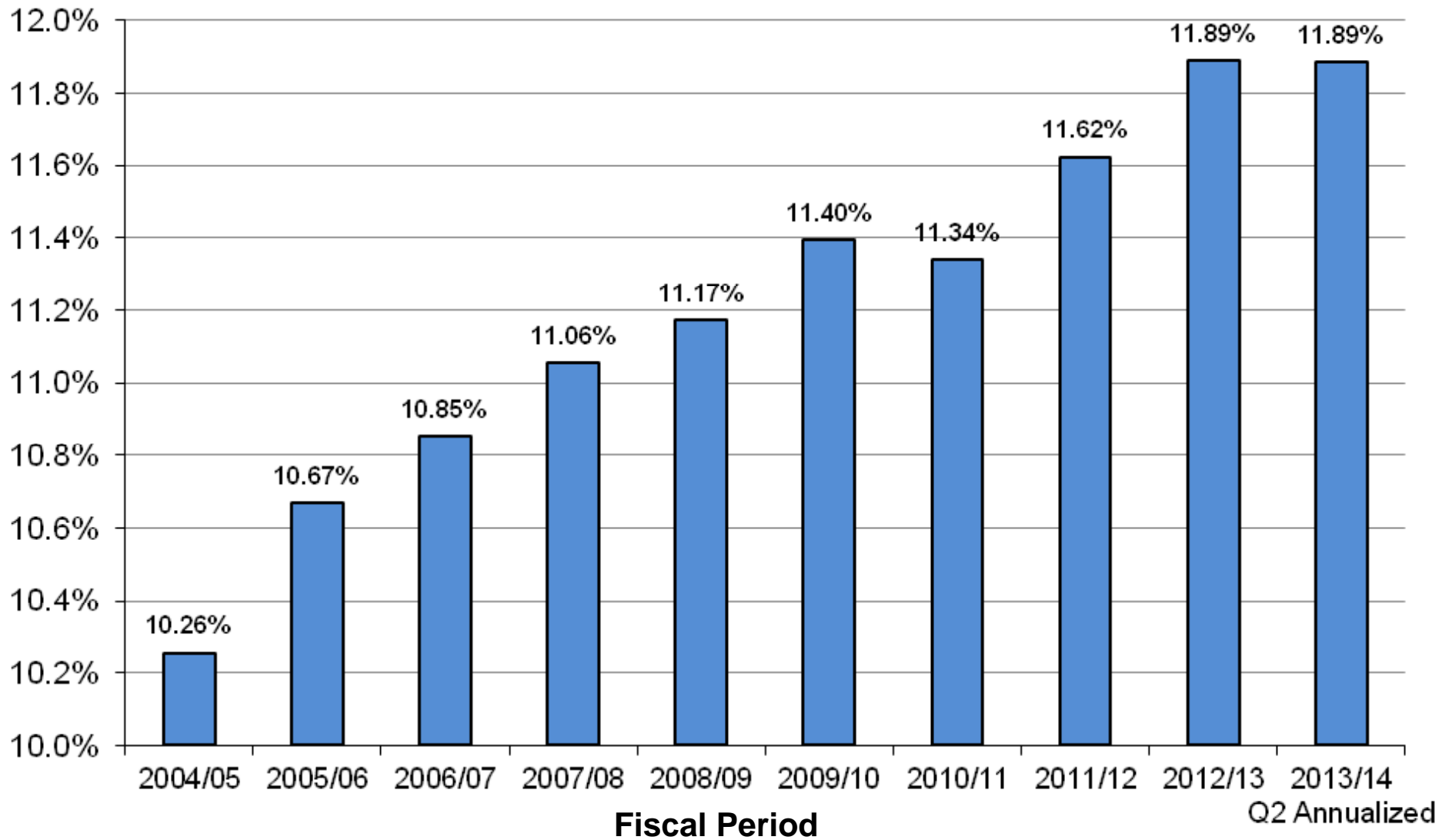
Source: CBS internal distribution data. Represents ~75% of Canadian supply

O-negative Red Cells Issued (per 1,000 pop)



Source: CBS internal distribution data. Represents ~75% of Canadian supply

O-negative red cell units issued (% of total RBC Issues)



Source: CBS internal distribution data. Represents ~75% of Canadian supply

Factors likely influencing demand for O-negative red cells

- Use of massive hemorrhage protocols
 - “blood boxes” containing o-neg red cells, AB plasma, platelets
- Increased use of phenotype-matched blood
- Other???



Supply of O- negative red cells

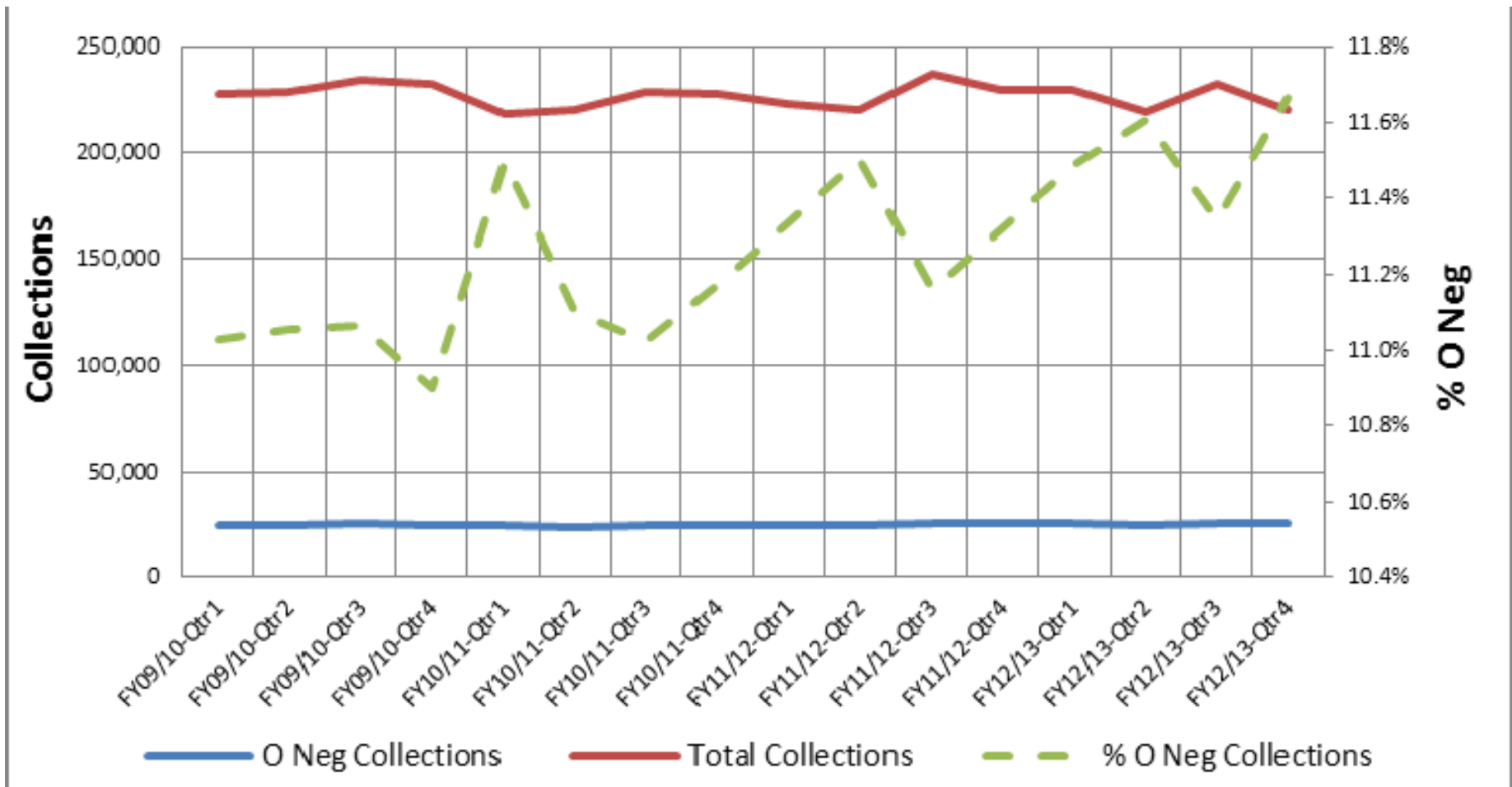
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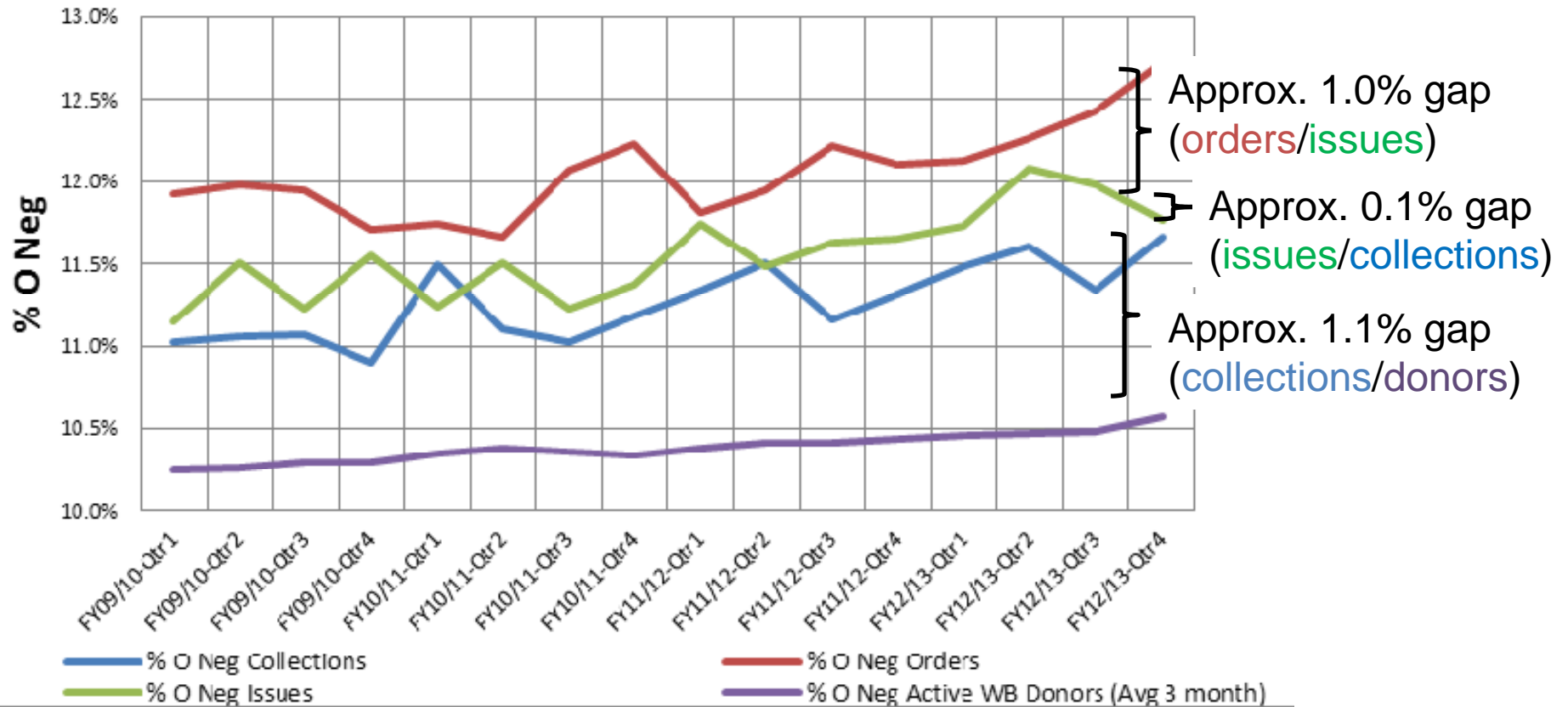
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O-negative Collections



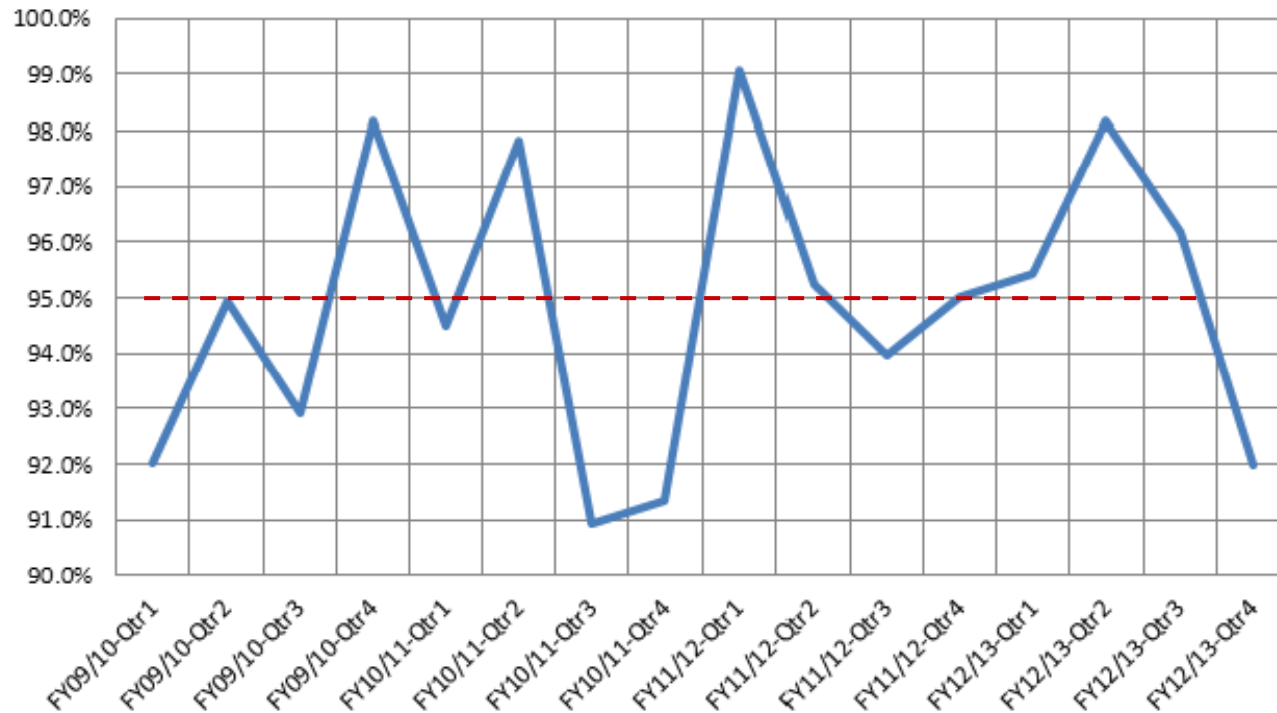
- % of O-neg collections has increased
 - 0.6% increase over past 4 years

% O Neg – Comparison of metrics (collections, orders, issues, donors)



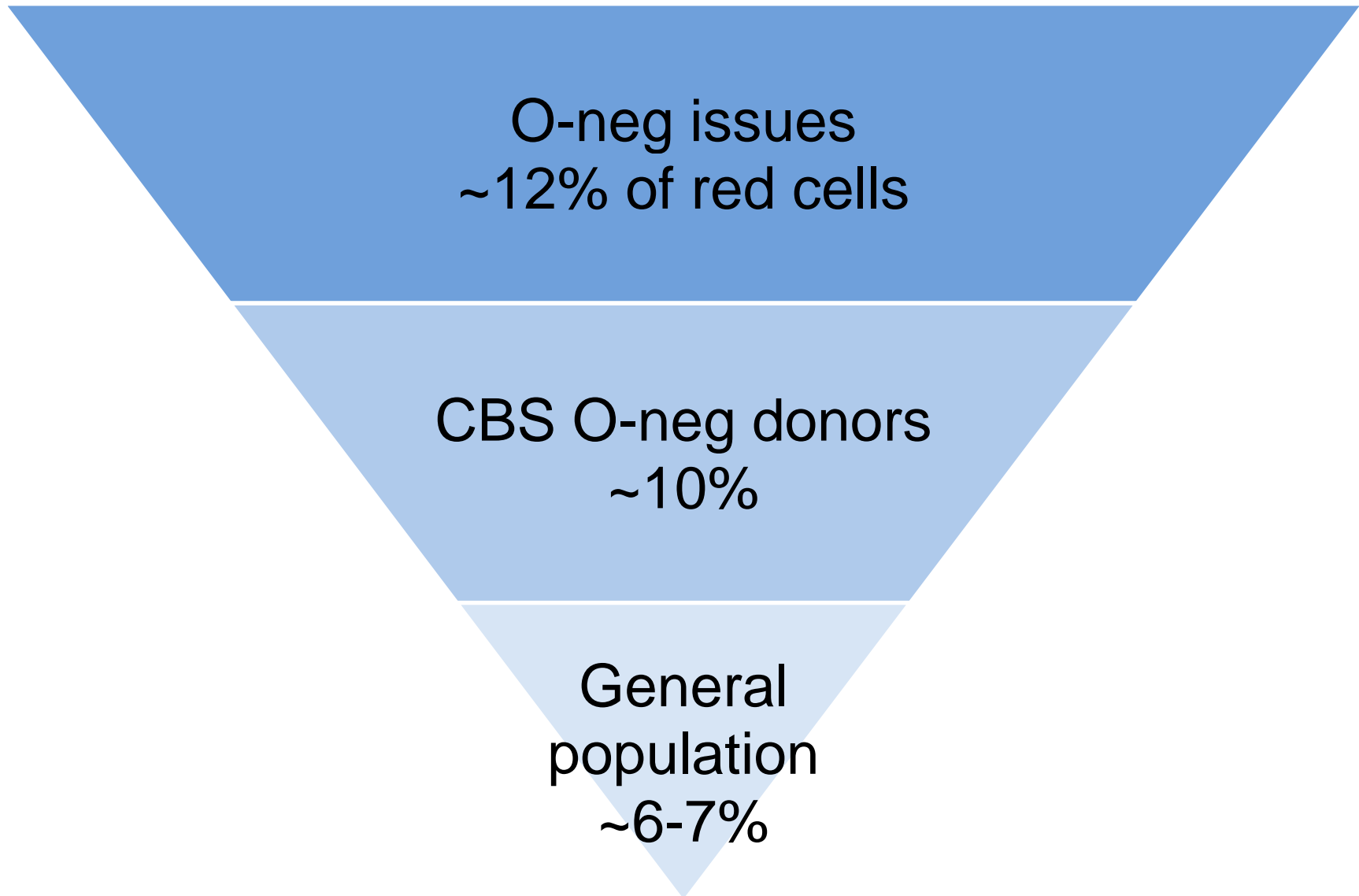
- ~2.2% gap between O-neg orders and available O-neg active WB donors
- ~1.1% gap between O-neg orders and issues

O-negative red cells – Order Fill Rate



- Over 16 Quarters, the (average) RBC O Neg Order Fill Rate has been above 95% EIGHT times, and below 95% EIGHT times
 - FY12/13 Q1, Q2 and Q3 were all above 95%
 - FY12/13 Q4 was below 95% (due to O Neg Advisory)

The problem



The Solutions

- Increase supply of O-negative red cells
- Decrease demand for O-negative red cells



Strategies to increase the supply of O- negative red cells

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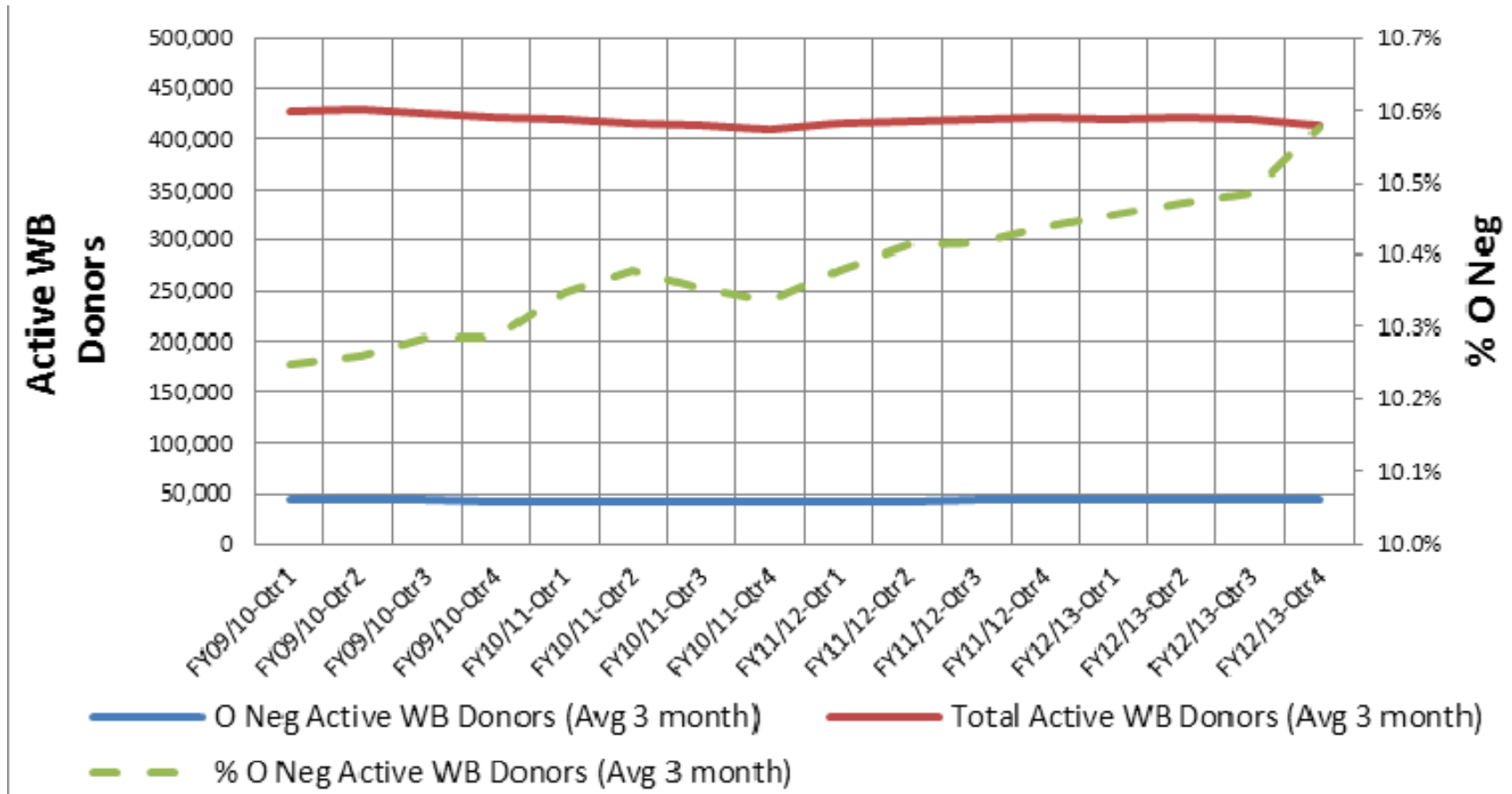
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Supply of O-negative red cells

- CBS has made a concerted effort to recruit and retain O-negative donors as well has encouraging frequent donations from these donors
- CBS strives to collect a higher percentage of O-neg units than is present in the donor population

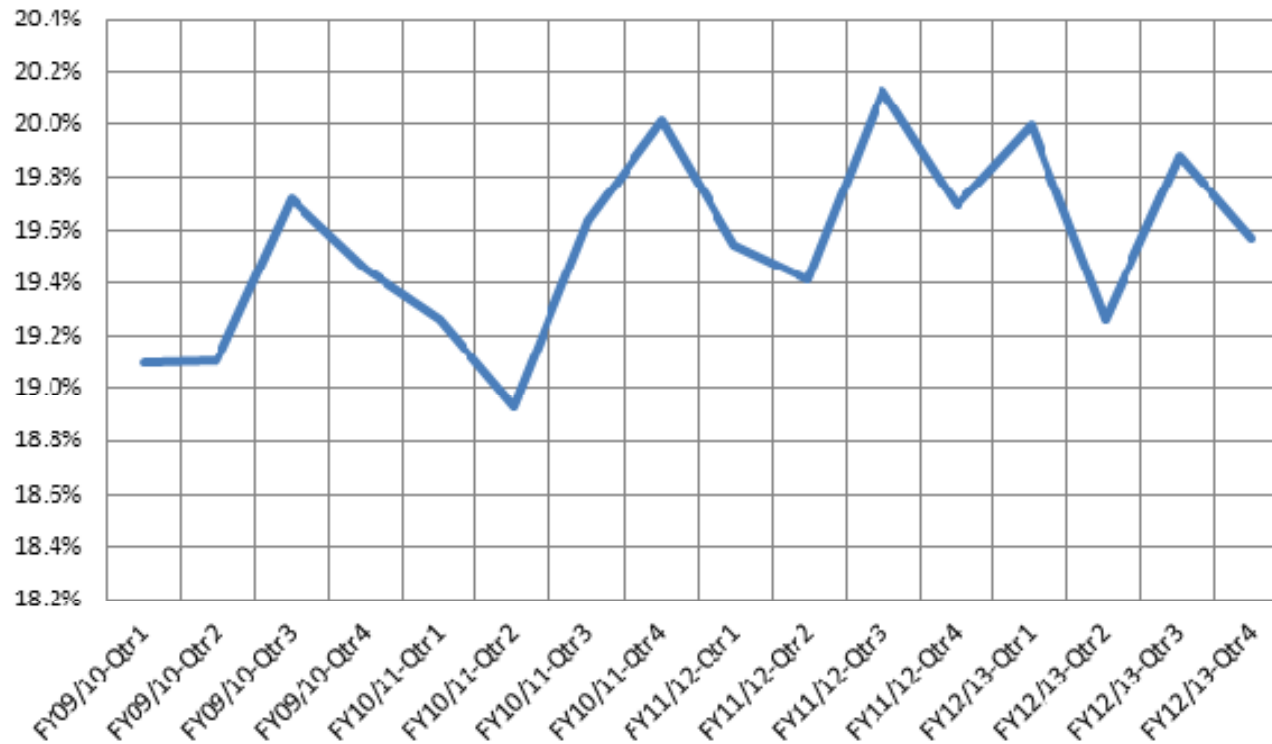


O-negative active whole blood donors



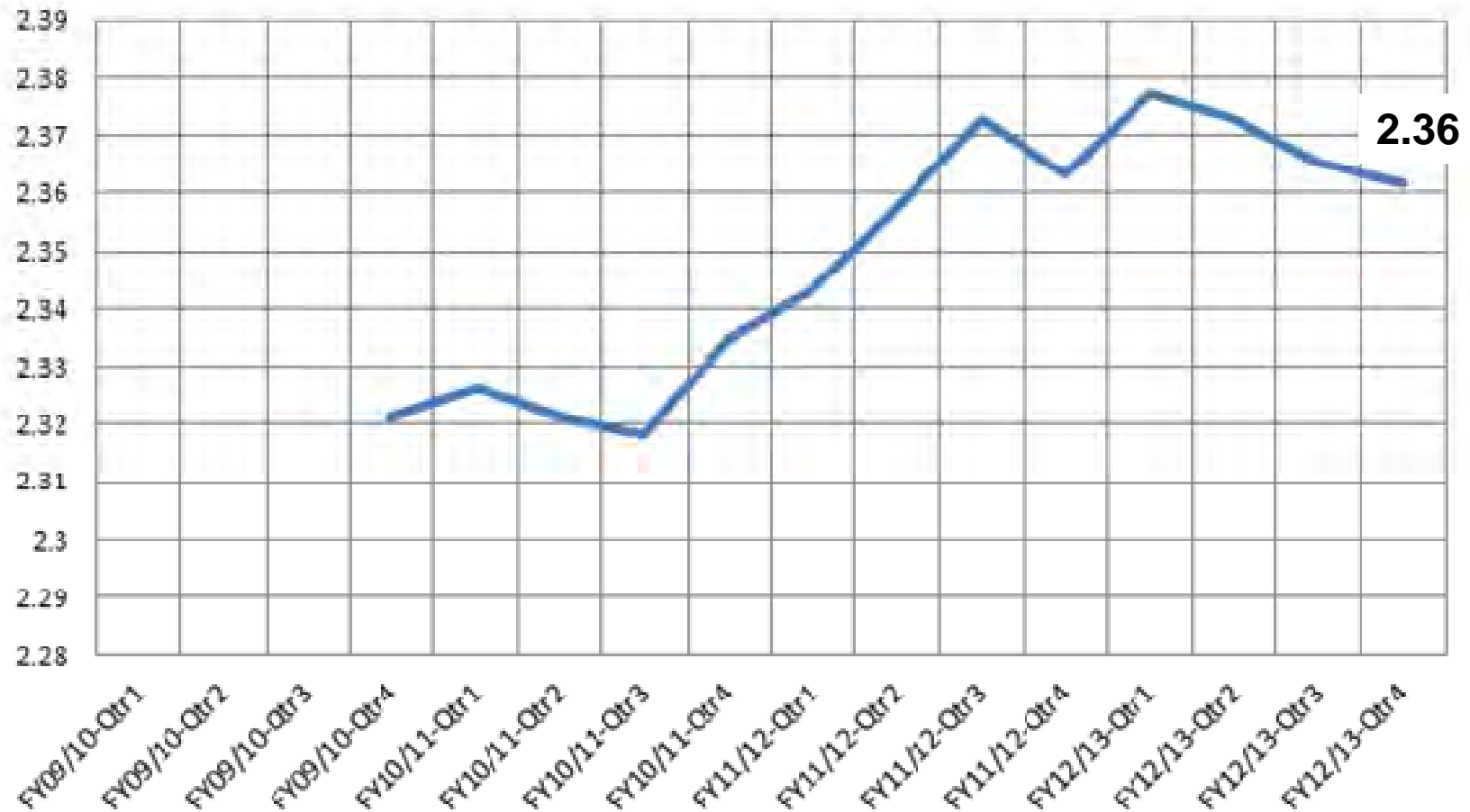
- % of O-neg WB donors has increased
 - 0.4% increase over past 4 years

O-neg – Collections per active whole blood donor



- % of O-neg collections from O-neg active whole blood donors has increased
 - 19.1% to 19.6% over past 4 years
 - we are collecting more blood from our base of whole blood O-neg donors

O-neg – average number of yearly collections per active whole blood donor



- O Neg Collections per Active WB Donor has increased over the past 4 years, from ~ 2.32 to 2.36 per year

Supply of O-negative red cells

- CBS needs to increase the number of O-positive and A-negative phenotyped units
 - This work is ongoing



Strategies to decrease the demand for O-negative red cells

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Demand for O-negative red cells

- O-neg red cells need to be used appropriately to ensure availability for those patients for whom there is no alternative



Demand for O-negative red cells

- *“The greater good of the community, including its patients who present as Rh-neg and cannot receive what they need, is compromised by wasting Rh-neg because a rare patient MAY be harmed”*

Dr. Paul Schmidt, Florida Blood Services
www.cbbsweb.org

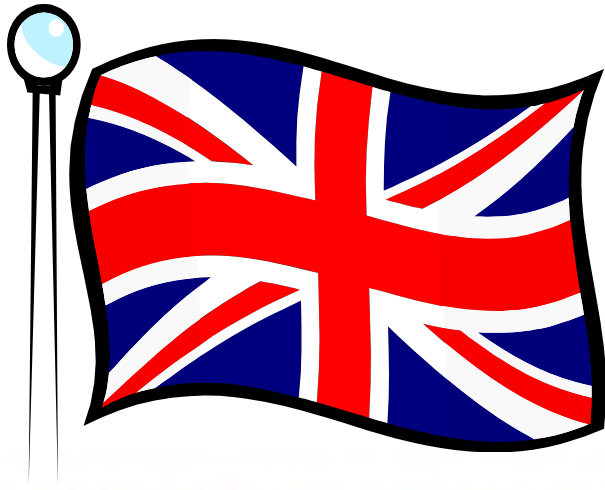
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What the UK did to decrease demand for O-negative red cells...



UK and O-neg

- Concern that O-neg blood was being used inappropriately and that, at a time when levels of donated red cells are low, there was the possibility that demand would outstrip supply
- Conducted audit to determine whether stockholding and the use of O-neg red cells were appropriate



UK and O-neg

- Invited hospitals in England, Scotland, Wales and Northern Ireland to participate
 - 182/318 participated
- Collected transfusion data on first 40 transfusion episodes from June 1, 2008, patients only included once
- Hospitals asked to record stock levels of each blood group at same time each day in June



UK: O-neg--Indications for use

Mandatory indications

- O-neg patients with anti-D
- O-neg females ≤ 60 yr
- Emergency use for females ≤ 60 yr where blood group is unknown

Recommended indications

- O-neg patients who receive/are likely to receive repeated transfusions

Stainsbury and Murphy, 2003

NHS Blood and Transplant. 2010 Re-audit of the Use of Group O RhD Negative Red Cells

UK: O-neg--Indications for use

Acceptable indications

- O-neg males or females > 60 yr with no anti-D where ≤ 8 O-neg units are transfused
- Non-O-neg infants ≤ 1 yr of age where group specific units are unavailable
- Emergency patients where the blood group is unknown at the time of transfusion, up to 2 units
- Non-O-neg patients requiring special phenotype d blood where group specific units are unavailable

Stainsbury and Murphy, 2003

NHS Blood and Transplant. 2010 Re-audit of the Use of Group O RhD Negative Red Cells



UK: O-neg--Indications for use

Unacceptable indications

- O-neg males and O-neg females > 60 yr with no anti-D where > 8 units are required
- Emergency where group is unknown and patient receives ≥ 3 units

Stainsbury and Murphy, 2003

NHS Blood and Transplant. 2010 Re-audit of the Use of Group O RhD Negative Red Cells



UK and O-neg

- Average stockholding in hospitals of O-neg red cells was 16.7% of red cell stock
 - Only 2.7% of sites reported having levels <8%
 - 17.3% of sites were >20%
- 77.6% of O-neg transfusions were given for mandatory, recommended or accepted reasons
- In 11.3% of documented transfusion episodes, O-neg was transfused non-emergently to known non-O-neg recipients to avoid outdating

O-Negative Red Cells: General Principles/Recommendations

- Hospitals should regularly review policies for use of O-neg RBC for emergencies and investigate incidences where use is considered inappropriate
- Hospitals should regularly review practice of emergency transfusion of O-negative red cells to non-O-neg patients
 - UK: in some cases patients being unnecessarily transfused with >3 units
- Hospitals must provide group specific red cells rapidly to avoid unnecessary use of emergency group O-neg RBC

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O-Negative Red Cells: General Principles/Recommendations

- For group O-pos recipients with alloantibodies, all efforts must be made to identify phenotypically matched group specific blood
- The blood supplier should provide a sufficient number of extensively phenotyped O-pos units of blood in order to enable the appropriate selection of group specific blood for patients with alloantibodies

NHS Blood and Transplant. 2010 Re-audit of the Use of Group O RhD Negative Red Cells

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O-Negative Red Cells: General Principles/Recommendations

- Adequate inventory policies should be in place to minimize wastage of O-neg RBC (UK: reduce stockholding level to <10.5%)
 - Avoid wastage due to:
 - Expiration
 - Electively transfused to non-group O recipients
- Appropriate policies which guide use of O-neg RBC should be introduced in order to reduce unnecessary high stockholding levels

NHS Blood and Transplant. 2010 Re-audit of the Use of Group O RhD Negative Red Cells

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Raising awareness of the issue

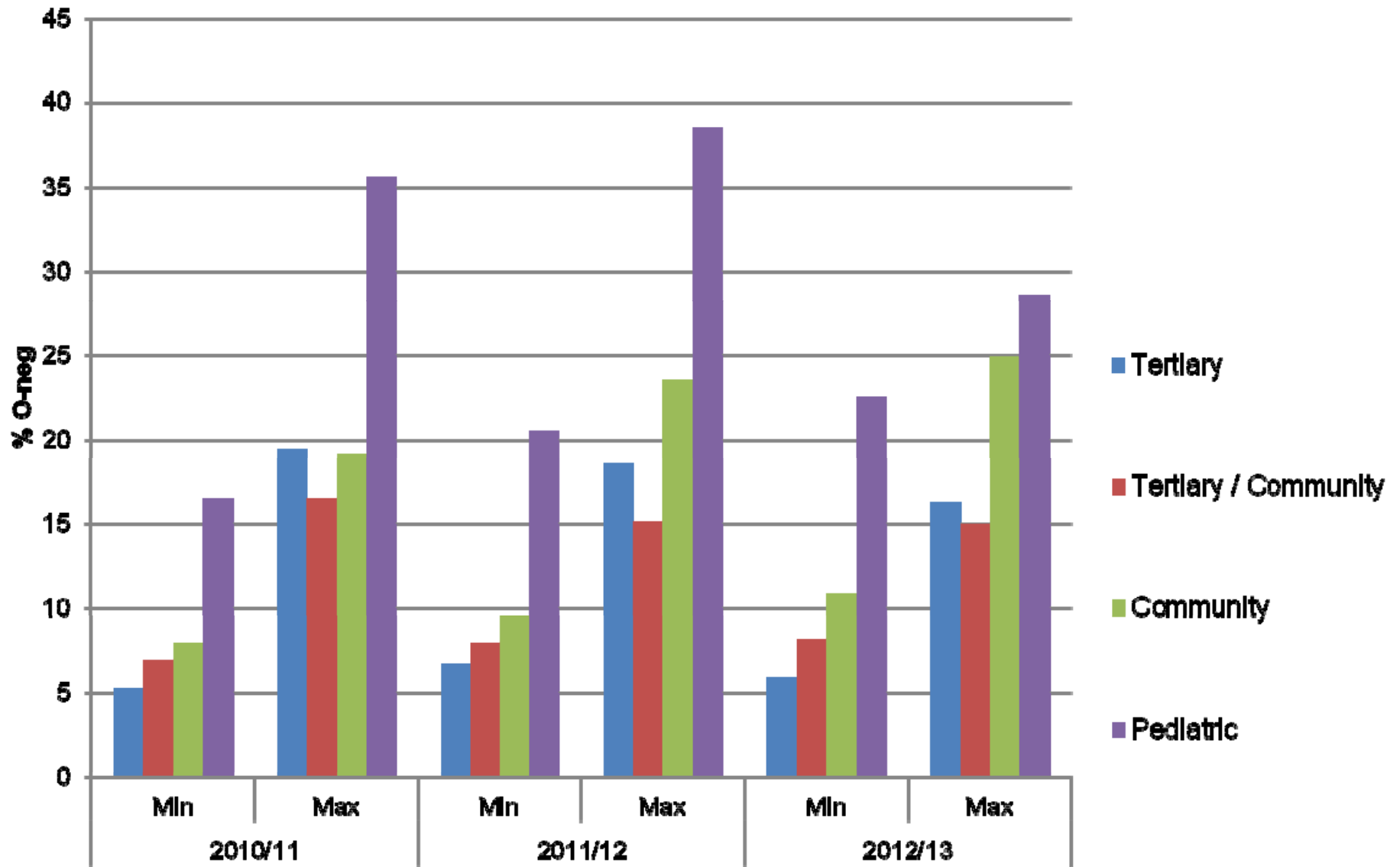
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Range of O-neg issues by hospital type



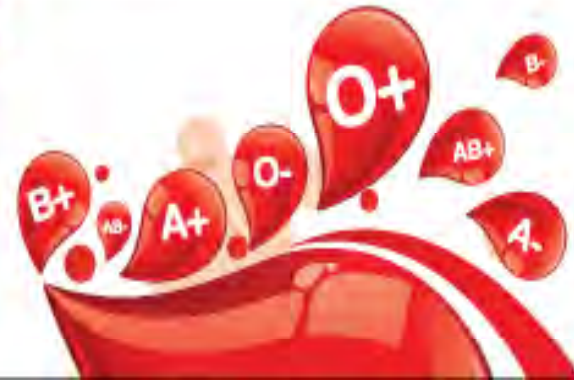
GOAL:

Promote optimal utilization of O Rh negative red blood cells by heightening hospital awareness of issue trends over time.



BloodBrief

-An Update on ONeg-



- Issue a 'status report' to top 50 hospital users:
- 3 years of issue data
 - O neg as % of:
 - All blood groups
 - Total group O blood
 - Ranking (1st, 2nd, 3rd etc)

Current Ranking:

1st # O Rh negative Red Blood Cells received from CBS

	Total O neg RBC units issued	O neg as % of all blood group RBC units issued	O neg as % of group O RBC units issued
2012-2013	4475	13.5%	26.5%
2011-2012	4255	11.9%	24.3%
2010-2011	4498	12.6%	25.7%

O Negative RBC Ranking (within list of top 50 hospital users)

	Per absolute # of O neg units received	O neg as % of all bld groups	O neg as % of all grp O
2012-2013	1st	15th	15th
2011-2012	1st	T 18th	17th
2010-2011	1st	11th	T 10th

Engagement

Hospital Transfusion Committees

- Letter addressed to Chair, TM Director cc'd
- Physician to Physician correspondence
- Also will copy: Centre MD, Hospital Liaison Specialist, Production Manager, PBCO, Ministries of Health



Progress

- First set of Blood Brief reports sent out September 2013
 - Several hospitals requested data for all hospitals within their centre
- Follow-up survey (30 hospital sites)
 - 84% influenced to review transfusion practice



One Canadian Hospital example

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One hospital's example

- All males (regardless of age) and all females > 50 years receive O-pos red cells for unmatched support
- No ER has stock inventory
 - All unmatched inventory is held under blood bank control



One hospital's example

- Inventory levels are assessed on a daily basis at blood bank rounds
- If the CBS local numbers are <3.5 DOH
 - If hospital inventory is good, standing orders are cancelled
 - Screening practice is initiated of patients requiring O-neg RBC
- Redistribution program in place to receive O-neg units with 7 days or less until expiry to ensure no wastage



Conclusions

- O-negative red cells are a precious resource
 - Despite increased donations from a limited number of donors, O-neg demand, at times, exceeds supply
- O-neg red cells need to be used appropriately to ensure availability for those patients for whom there is no alternative



Acknowledgements

- Cheryl Doncaster (CBS)
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Thank you!

