

Patient Blood Management – the Future in Hong Kong

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Chief Executive & Medical Director



Every blood donation
saves 3 lives

Why ME? Why NOW?

- Failure of increasing blood supply further to meet demand (explained by ageing population alone?)
- Ongoing needs to enhance patients' outcome with minimization of the risk and adverse reactions from blood transfusion (it is already evidenced from Patient Blood Management that practiced in developed countries for more than a decade.)



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saves 3 lives**

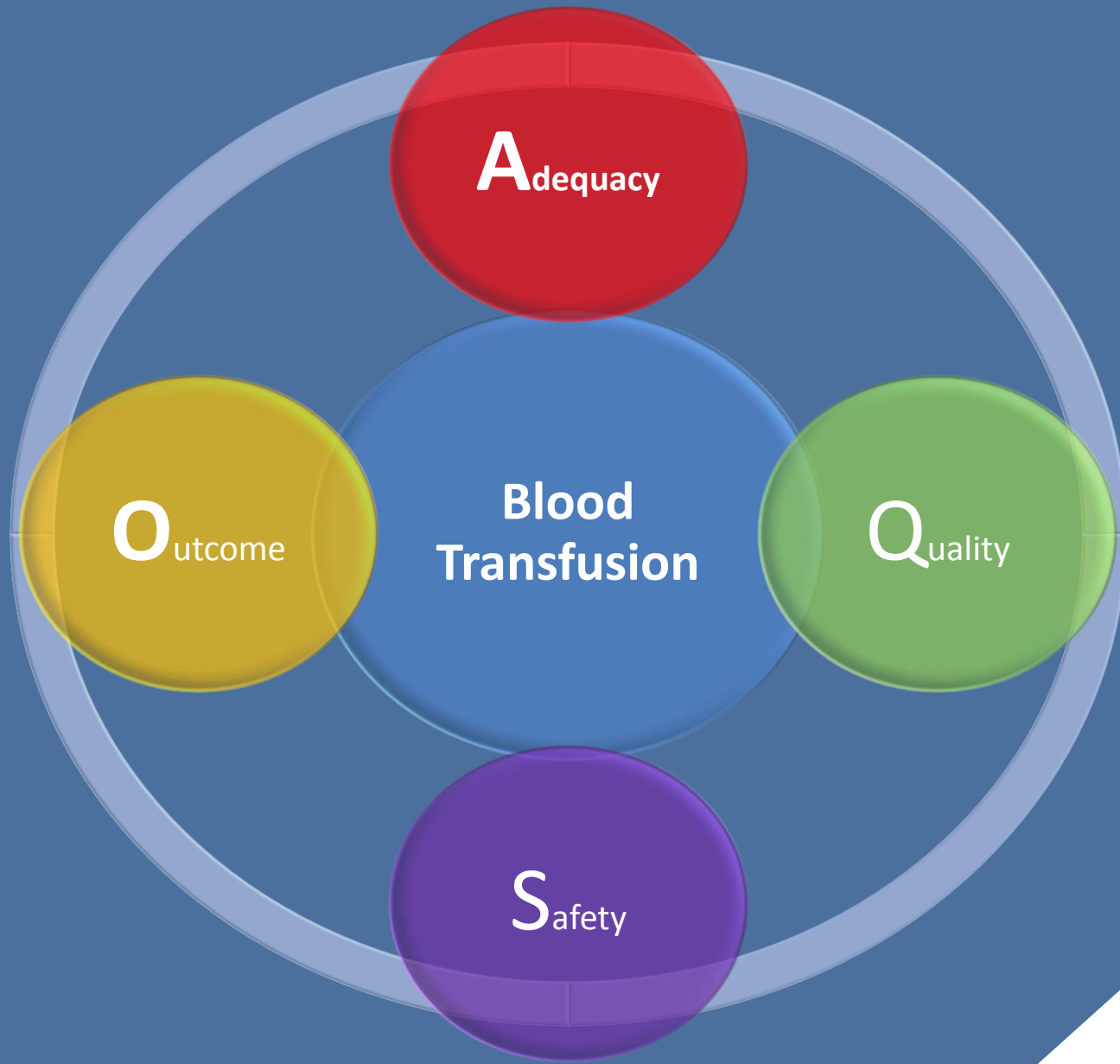
As a profession and blood supplier (also a blood user in the past)

1. Concerns on patients' cares and outcome.
2. Ensure blood supply is available as safe and of quality in a timely manner.
3. Ensure donor is safe to donate and does not have un-necessary side effects from donation.



**Every blood donation
saves 3 lives**

Let re-focus at blood transfusion



**Every blood donation
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Adequacy and availability


- Doctors, Patients, Relatives, Public – most consider “Always available”
- Not knowing that it applies to common blood products only; but they can be affected by external factors. e.g. interruption of blood collection by typhoon causes shortage of platelet supply
- For uncommon products or rare blood types – take time to get them e.g. need to call up special donors, only in frozen inventory or from overseas



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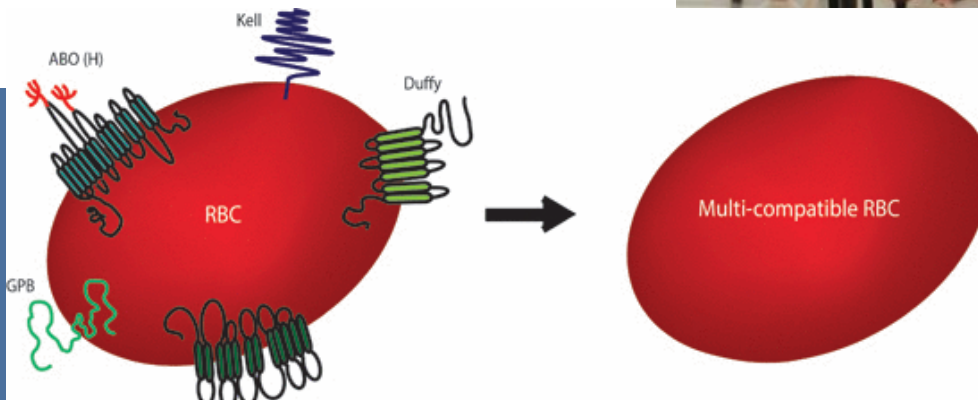


Enhancement of red blood cell transfusion compatibility using CRISPR-mediated erythroblast gene editing

Joseph Hawksworth, Timothy J Satchwell, Fiona Regan, Nicole M Thornton, Marie Geert J Streekstra, Kongtana Trakarnsri, Jan Frayne,  Ashley M Toye

Author Affiliations

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Every blood donation saves 3 lives

Safety

- Again, expect 100% safe!
- But adverse reactions are common e.g. FNHTR, allergic reaction
- Rarely infections can still happen as not all agents are known or can be screened
- Even with pathogen reduction technology, not all blood components are the same. Gain in safety may mean some losses in quality or quantity
- Note: mis-identification of patients not uncommon and can carry serious risk



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Observed Risk of Blood Transfusion in Hong Kong

Incidence of all Adverse Transfusion Reaction	1:1,718
Incidence of Major Adverse Transfusion Reaction	1:36,704
Incidence of all Transfusion Incident	1:1,187
Incidence of Transfusion Incident with Severity Index ≥ 4	1:80,750

Current residual risk of TTI in Hong Kong*

HIV	1 in 3,368,000 (based on Window Period of 5.9 days)
Hepatitis C	1 in >10,000,000 (based on Window Period of 2.6 days)
Hepatitis B	1 in 126,000 (based on Window Period of 15.1 days)
Bacteria in red cell transfusion	1 in 500,000
Bacteria in platelet transfusion	1 in 10,000



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Cost

- Blood supply and blood transfusion are not without cost (manufacturing, administration and handling of adverse reaction)
- Most blood centers do charge for cost recovery



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Quality & Outcome

- No one can 100% guarantee at the highest quality and maximal effectiveness
- Can be affected at different stages
- Clinical variables most frequent contributing factors impacting quality and outcome



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What is Patient Blood Management (PBM)?

- PBM improves patient outcomes by *improving the patient's medical and surgical management in ways that boost and conserve the patient's own blood.*
- As a consequence of better management, patients usually require fewer blood transfusions thus avoiding transfusion-associated complications.



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The rationale for patient blood management addresses evidence-based transfusion medicine practice and stewardship of donated blood, to:

1. view a patient's own blood as a valuable and unique natural resource that should be conserved and managed appropriately;
2. acknowledge that altruistically donated blood is a valuable, unique and costly resource that is held in trust, and that it will only be used as therapy when there is evidence for potential benefit and potential harm will be minimised;
3. consider transfusion alternatives;
4. ensure quality products are available in a timely and safe manner;
5. ensure potential hazards are considered and balanced against the benefits; and
6. explain the benefits and risks to the patient/relatives.



What are the Issues in Hong Kong Now?



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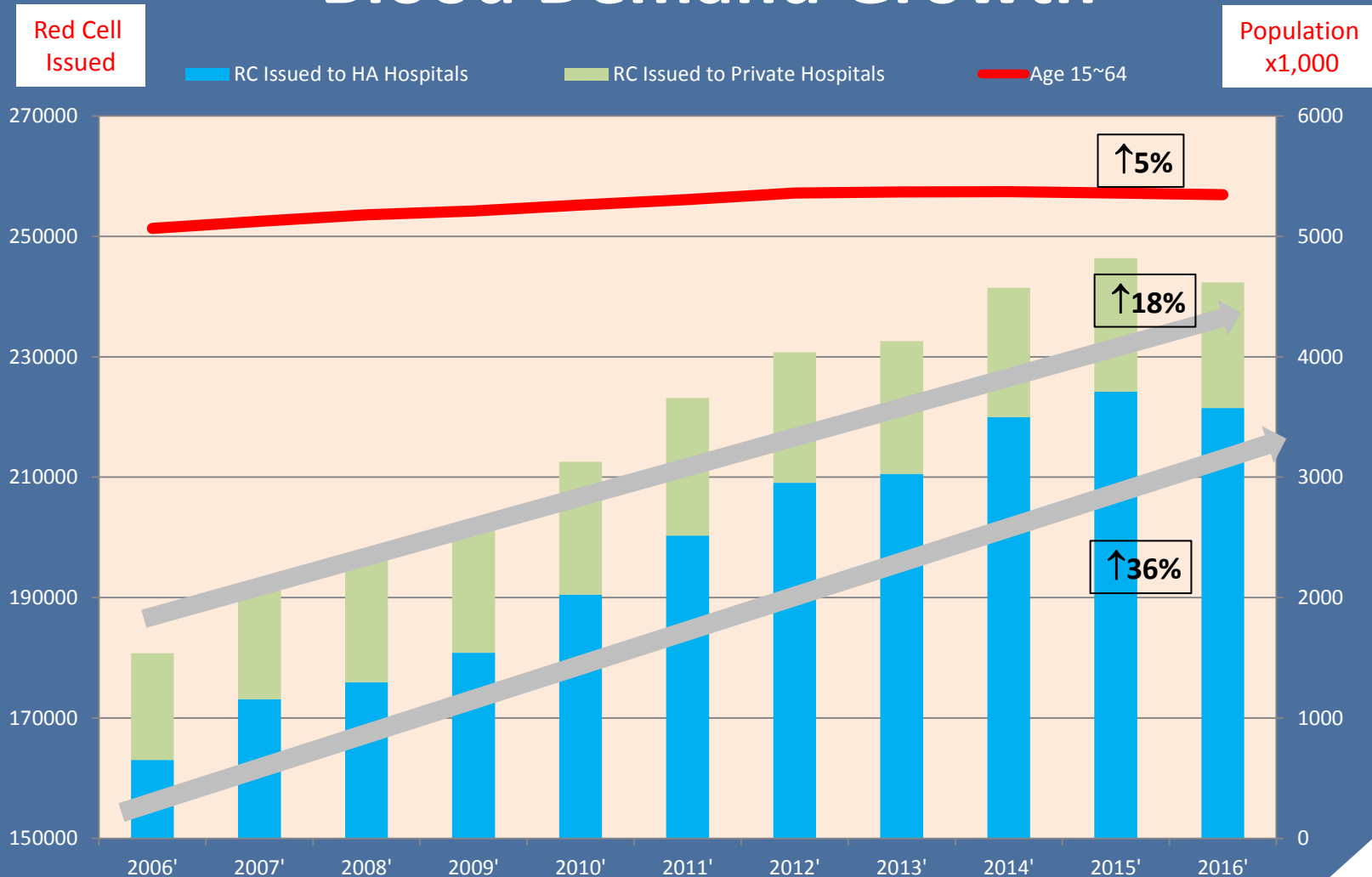
Blood Supply **NOW** encounters significant difficulties!

- Poor responses of the public to recruitment and publicity
- High deferral risk due to low pre-donation haemoglobin (iron deficiency) and others in particular travel history risk
- Impact of weather in particular typhoons and cold weather
- Rumours that blood exported outside HK and used in non HK residents



**Every blood donation
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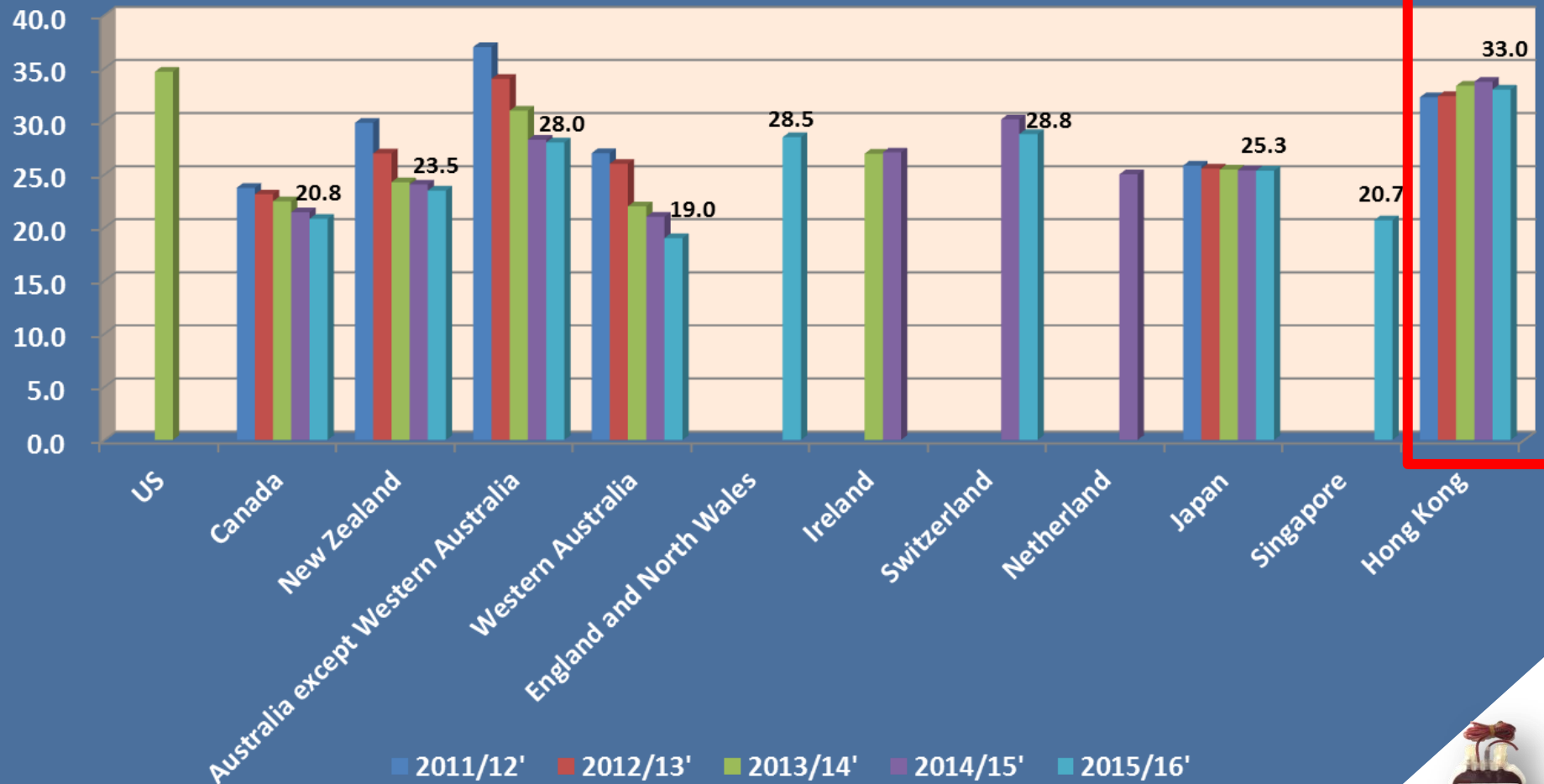
Donation Population Growth vs Blood Demand Growth



Every blood donation saves 3 lives

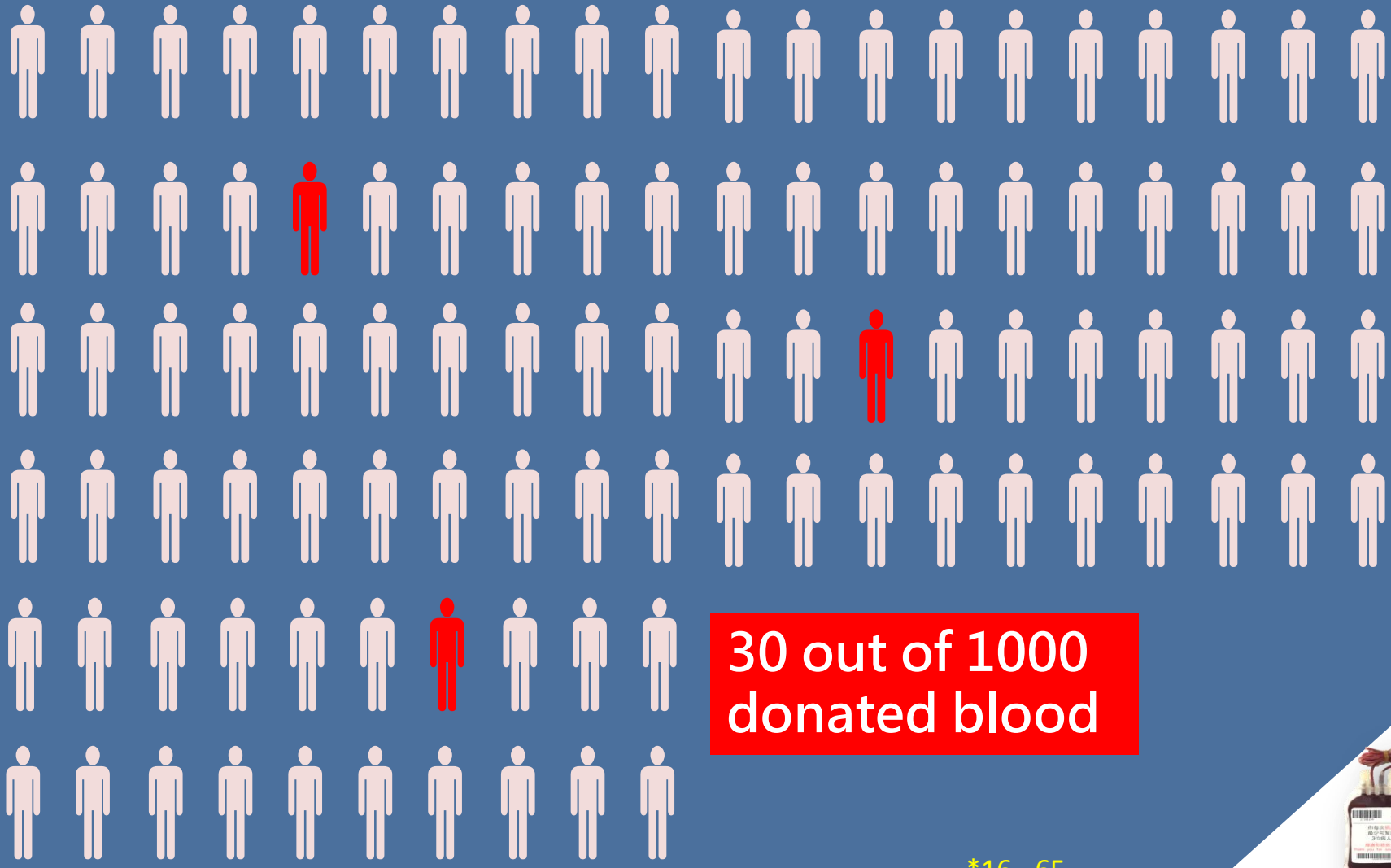
Hong Kong is using more blood than other developed countries

Red Cell Use per 1,000 Population



Every blood donation
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Theoretical Donors Pool*



30 out of 1000
donated blood

*16 - 65



Every blood donation
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Real Problems in Sustaining Blood Supply

as shown in 2017 statistics

- Significant drop in
 - donor attendances: **4.7%** (from 328,318 in 2016 to 312,972),
 - blood collection: **5.3%** (from 258,222 in 2016 to 244,653),
 - new donors: **8.25%** (from 36,651 in 2016 to 33,626),
- Still high percentage of donors being deferred: **22%** (68,319 prospective donors were deferred for various donor and blood safety reasons – mostly low haemoglobin and travel history risk).



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市民鐵質不足
「暫緩」人數增

年輕人捐血登記減 紅會血存僅夠三四日



記者：蔡俊傑

香港紅十字
會輸血服務中心

昨日公布上年血液收集及供應情況，上年首次捐血者較前年大跌百分之八點三，僅有約三萬四千人，創五年以來新低，當中十六歲首次捐血登記人次亦有下跌。全年參與捐血人數亦較前年跌百分之四點七，僅約三十一萬三千人次，主要受上年五度颱風影響，其中一日全日無法收集血液。中心指，現有血庫僅有三至四日儲存量，將逐步推行多項優化措施，冀可增加捐血人次。

紅十字會輸血服務中心行政及醫務總監李卓廣昨日公布年度血液收集及分發情況，坦言上年捐血情況不理想，全年參與人數僅有約三十一萬三千人次，較前年跌百分之四點七；當中只有約二十四萬五千人成功捐血，亦按年下跌百分之五點三。

數據亦顯示，上年首次捐血者較前年大跌百分之八點三，僅有約三萬四千人，當中十六歲首次捐血登記人次亦有減少，僅有約七千六百人。李卓廣指，中心正分析學生捐血者下跌原因，估計因高中學制改變，導致學生接觸捐血機會減少，亦與捐血態度改變有關，認為不少學生未能了解捐血意義，及未見即時成效，因而對捐血卻步。對於上年有謠言指血液轉贈內地，李強調「所有血液未曾離開香港」，但承認這已影響年輕人觀感，日後會加強宣傳及教育工作。

血液轉贈內地謠言有影響

另外，上年受天氣影響，六月至十月共五度出現八號或以上熱帶氣旋，令血液收集的工作暫停或終止，其中十月十五日



行政及醫務總監李卓廣(右三)坦言上年捐血情況未如理想。

全日未能收集任何血液。天氣寒冷亦影響捐血意欲。中心分析過去五年數據，發現當氣溫為十度，市民捐血數字將較每日一千一百人目標下跌一成，當氣溫跌至五度，捐血人數將大跌約四成；其中本月曾出現七度低溫，當天捐血人數僅約五百人。現時血庫僅有三至四日儲存量，更已連續多日無法達到每日一千一百人捐血目標。

此外，上年約有六萬八千人暫緩捐血，主要原因是血紅素不足，佔整體被暫緩捐血總人數五成二。李卓廣認為，本港市民飲食習慣不健康，鐵質攝取不足，出現貧血等問題，情況較東南亞其他地區嚴重。

血液使用方面，中心上年共分發約四十九萬袋血製品，較前年減少百分之一點三。超過八成應用於內科及老人科，外科和骨科，當中六成四用於六十歲或以上長者。

讀報學中文
教材詳見F5版

紅會過去兩年捐血情況比較

	2016年	2017年(百分比)
血液收集		
參與捐血人數	328,318人次	312,972人次 (-4.7%)
成功捐血人次	258,222人次	244,653人次 (-5.3%)
被暫緩捐血人次	70,096人次	68,319人次 (-2.5%)
首次捐血者	36,651人	33,626人 (-8.3%)
16歲首次捐血登記人次	7,663人	7,607人 (-0.7%)
血液分發		
紅血球	242,379單位	230,981單位 (-4.7%)
血小板	187,935單位	194,945單位 (-3.7%)
新鮮冰凍血漿	64,358單位	61,168單位 (-5%)
合共	494,672單位	487,094單位 (-1.5%)

資料來源：香港紅十字會輸血服務中心

8 Feb 2018

BTS Annual Press Conference -
Low blood inventory
Less young donor
High deferral due to low Hb
and iron



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Iron Deficiency - A very serious public health problem in Hong Kong

警戒水平

鐵質不足無法捐輸 紅會血存量響警號

血庫告急！香港紅十字會輸血服務中心去年的血液收集量、參與捐血及成功捐血人次，均較前年下跌約百分之五，當中更有逾六萬人因血紅素不足等因素被暫緩捐血，而首次捐血人數亦較前年下跌超過百分之八。紅十字會認為，去年捐血情況不理想，目前各類血液存量已下降至警戒水平，呼籲市民立即前往捐血。



■紅十字會輸血服務中心昨表示，去年首次捐血人數只得三萬三千六百二十六人，較前年減近三千人，下跌百分之點二五。

香港紅十字會輸血服務中心昨表示，去年捐血登記總人數為三十一萬二千人，其中成功捐血人數為二十四萬四千六百五十三人，較前年分別下跌百分之四點七及百分之五點三。至於被暫緩捐血人數則有六萬八千三百一十九人，佔整體捐血人數兩成二，原因多為血紅素不足所致，故中心呼籲市民多吸收鐵質，以符合捐血要求。

紅十字會續指，去年首次捐血人數只得三萬三千六百二十六人，較前年減近三千人，下跌百分之八點三。輸血服務中心行政及醫務總監李卓廣估計，可能由於學

制改變，令學生在中學階段接觸捐血機會較少，中心會再研究學校捐血情況，令更多年輕人參與。

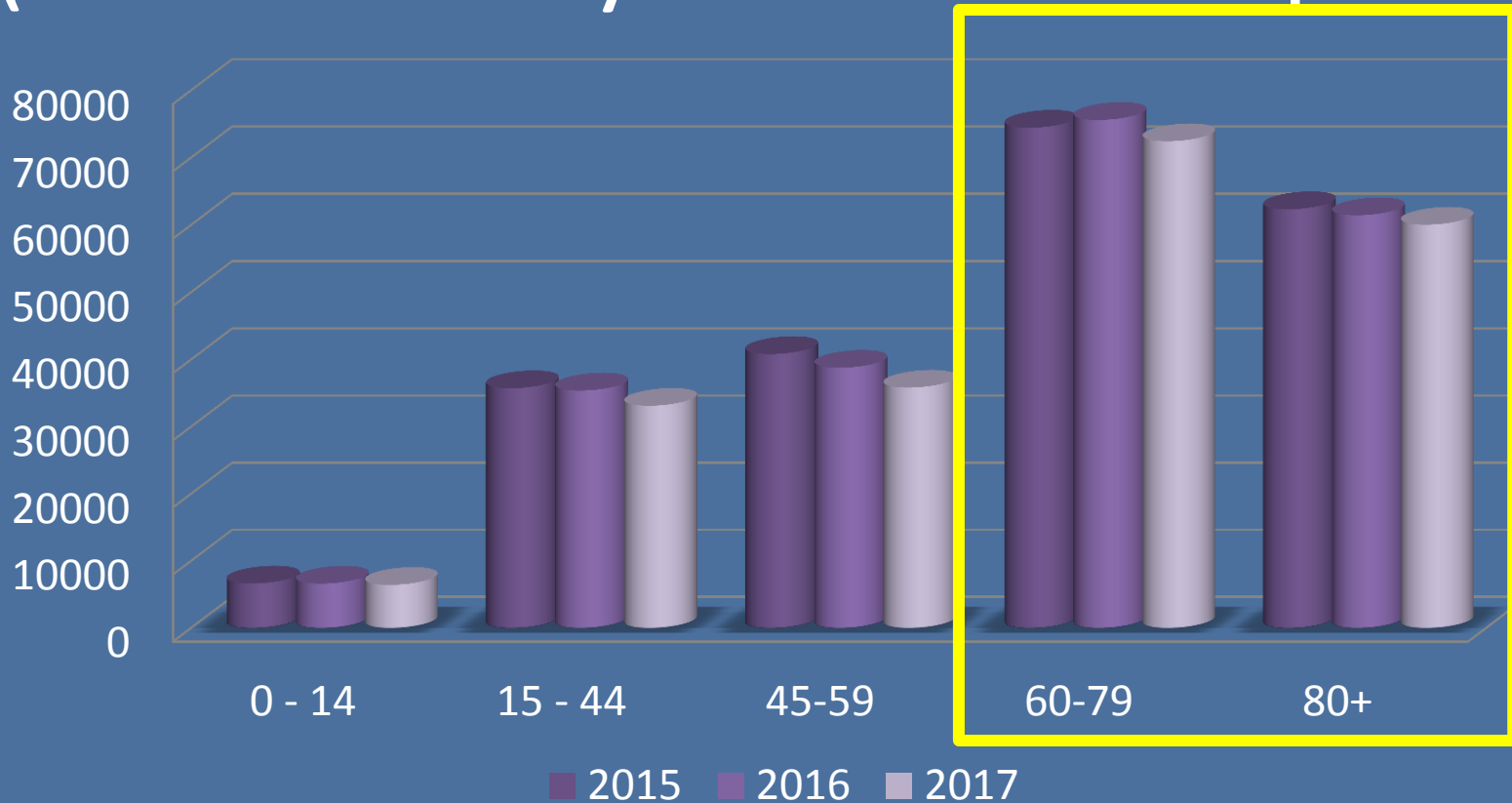
至於捐血人數下跌，他解釋主要與天氣有關，如去年有五個八號烈風或暴風信號，令紅十字會須暫時關閉捐血站及取消流動捐血站服務。

李卓廣表示，為加強捐血服務，中心推出一系列新措施，包括延長捐血站時間、加強流動捐血服務、手機短訊提示、網上預約及加強公眾宣傳等，另推出「給血聯盟」計劃，透過頒發金、銀、銅三個級別「給血聯盟」章，鼓勵更多市民成為恆常捐血者。



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Blood usage in HA (90% territory wide consumption)

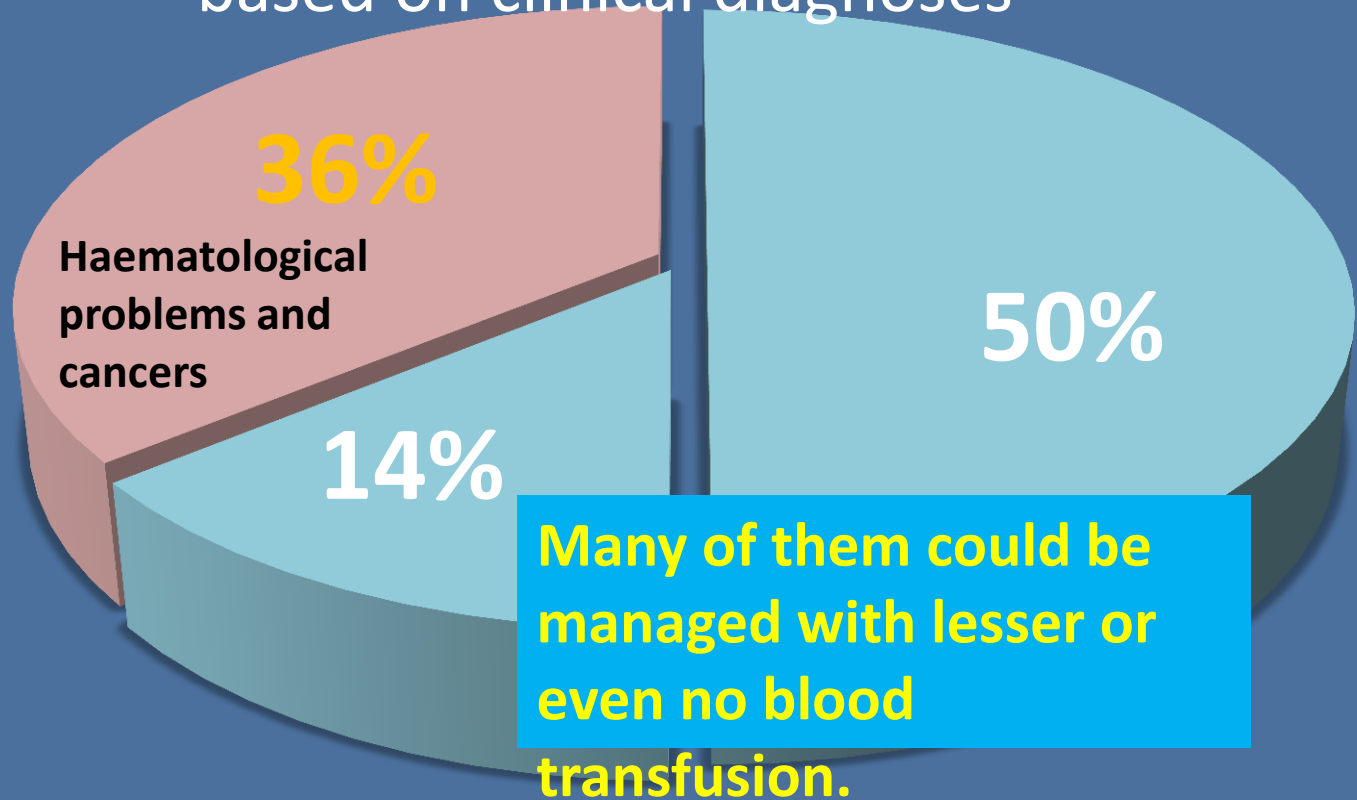


63.7% in patients aged 60 or above; 28.8% in 80 or above



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Who used our blood? based on clinical diagnoses



- Blood Loss (including gynaecology 4%, GI 20%, elective operation 13%, emergency operation 8%, trauma 5%)
- Renal Insufficiency (including haemodialysis 7%, peritoneal dialysis+CRI without dialysis 7%)



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In term of transfusion practices, Hong Kong is also behind

1. Liberal transfusion practice, with more than 60% having multiple units transfusion.
2. > 50% blood was used in treating various causes of anaemia, of which iron replacement (and ESA) could replace transfusion as the standard of care in many of these cases.
3. Haemostatic drugs use in bleeding control was far less frequently used locally.
4. Optimization of pre-operative anaemia by iron replacement was also infrequent.



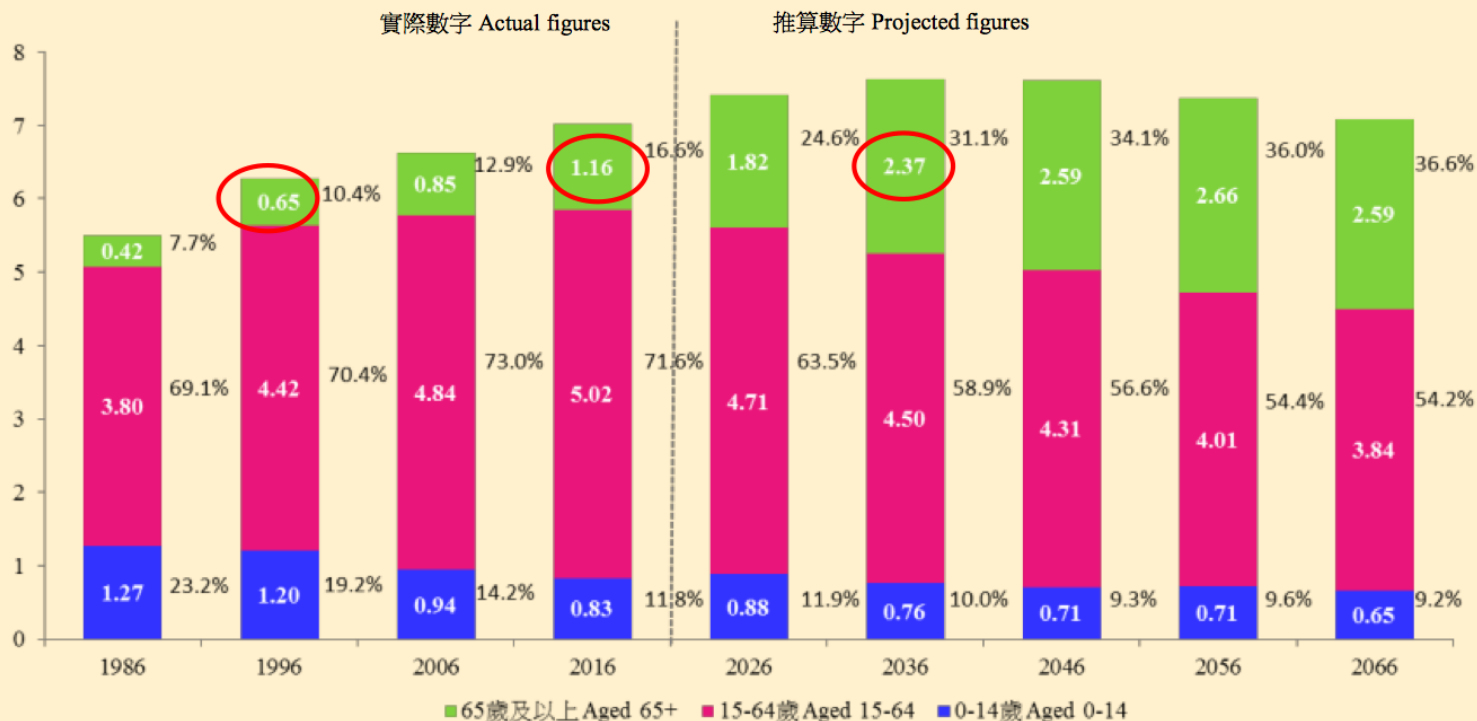
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老年人口增長，工作年齡人口萎縮

Growing elderly population and shrinking working age population

1986年至2066年按年齡劃分的人口分布
Distribution of population by age group, 1986-2066

人口(百萬人)
Population
(millions)



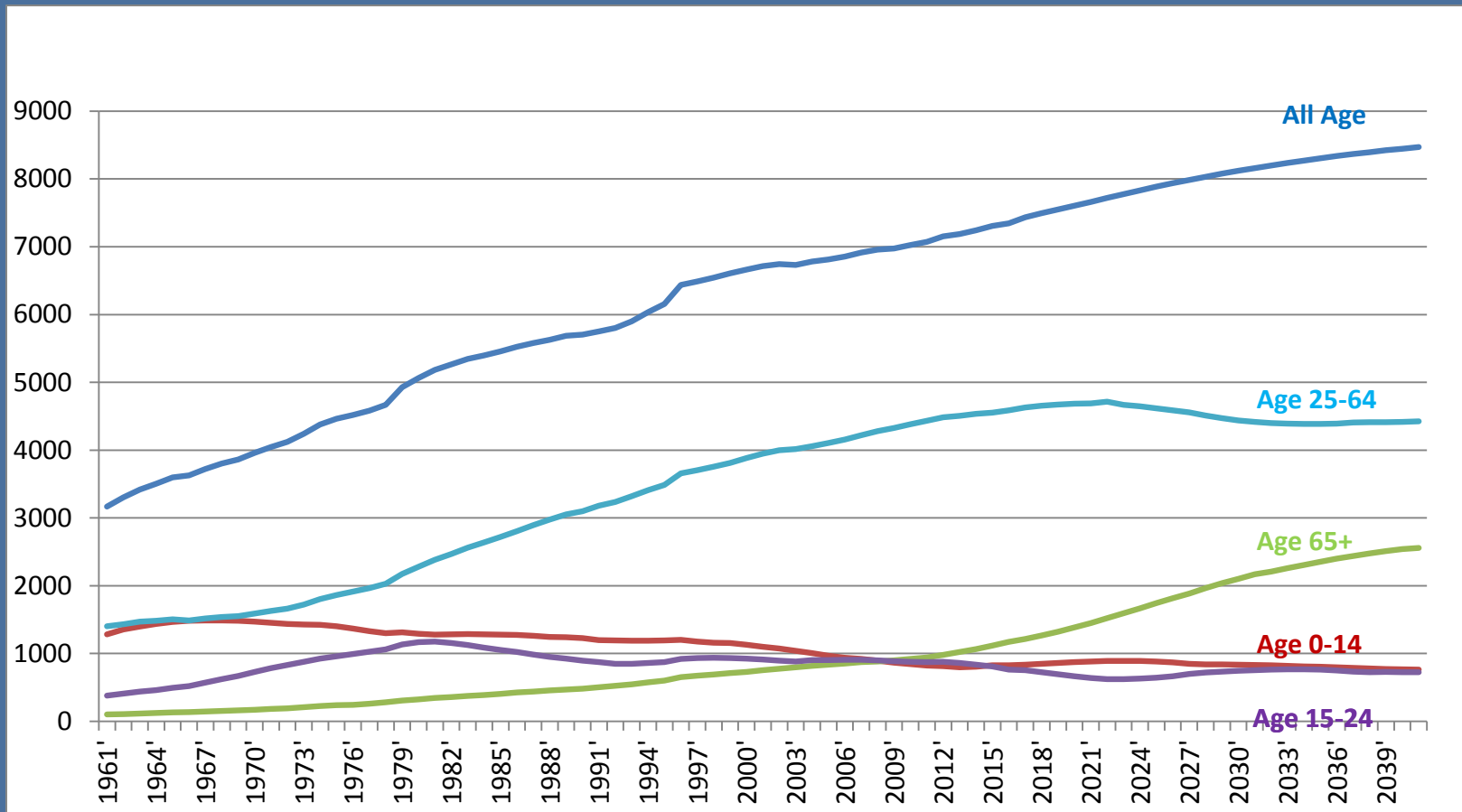
註：不包括外籍家庭傭工
Note: Excluding foreign domestic helpers



Every blood donation
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Rapidly Ageing Population

Marked Rise in Age 65+
Significant Drop in Age 15-24



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Our Ongoing Challenges -

Ageing is getting worse
Sustainability of our Blood
Supply will be even worse if no
change in blood transfusion
happens



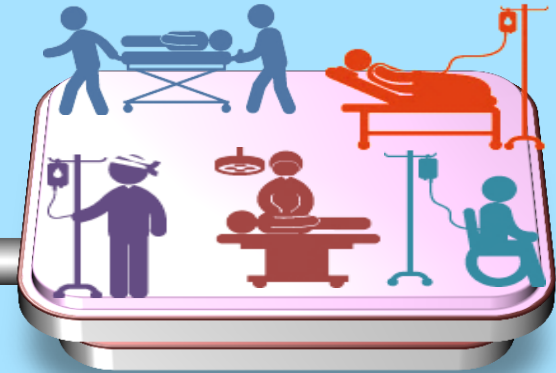
**Every blood donation
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Voluntary donation with eligibility
Shelf life
Avoid Expiration ,,,,

Not easy predicted
Outcome driven,,,

Supply

Demand



**Sustainability must be ensured
and properly addressed**

BTS is responsible for blood collection, processing and testing
BTS supplies blood to hospital blood banks which distributes blood
for patients requiring transfusion

Patient Blood Management to enhance patients' outcome and slow down demand growth



**Every blood donation
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Benefits of PBM are available

4 Adult Tertiary-care Hospitals in **Western Australia**
All **6-YEAR** admissions from **2008 - 2014** (=604,046 in total)
7.8% with transfusion (=47,382 patients)

CLINICAL OUTCOMES

Hospital length of stay	↓	15%
In- hospital mortality	↓	28%
Hospital- acquired infections	↓	21%
Heart attack or stroke	↓	31%

BLOOD PRODUCT UTILIZATION

Red Cell	↓	41%
311 → 182		
Plasma	↓	47%
94 → 50		
Platelet	↓	28%
53 → 38		

PRODUCT-RELATED COST SAVINGS

AU \$ 18.5M

Michael F. Leahy *et al.* Improved outcomes and reduced costs associated with a health system-wide patient blood management program: a retrospective observational study in four major adult tertiary-care hospitals. *Transfusion* 2017; Feb 2 .



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Hence, PBM definitely works

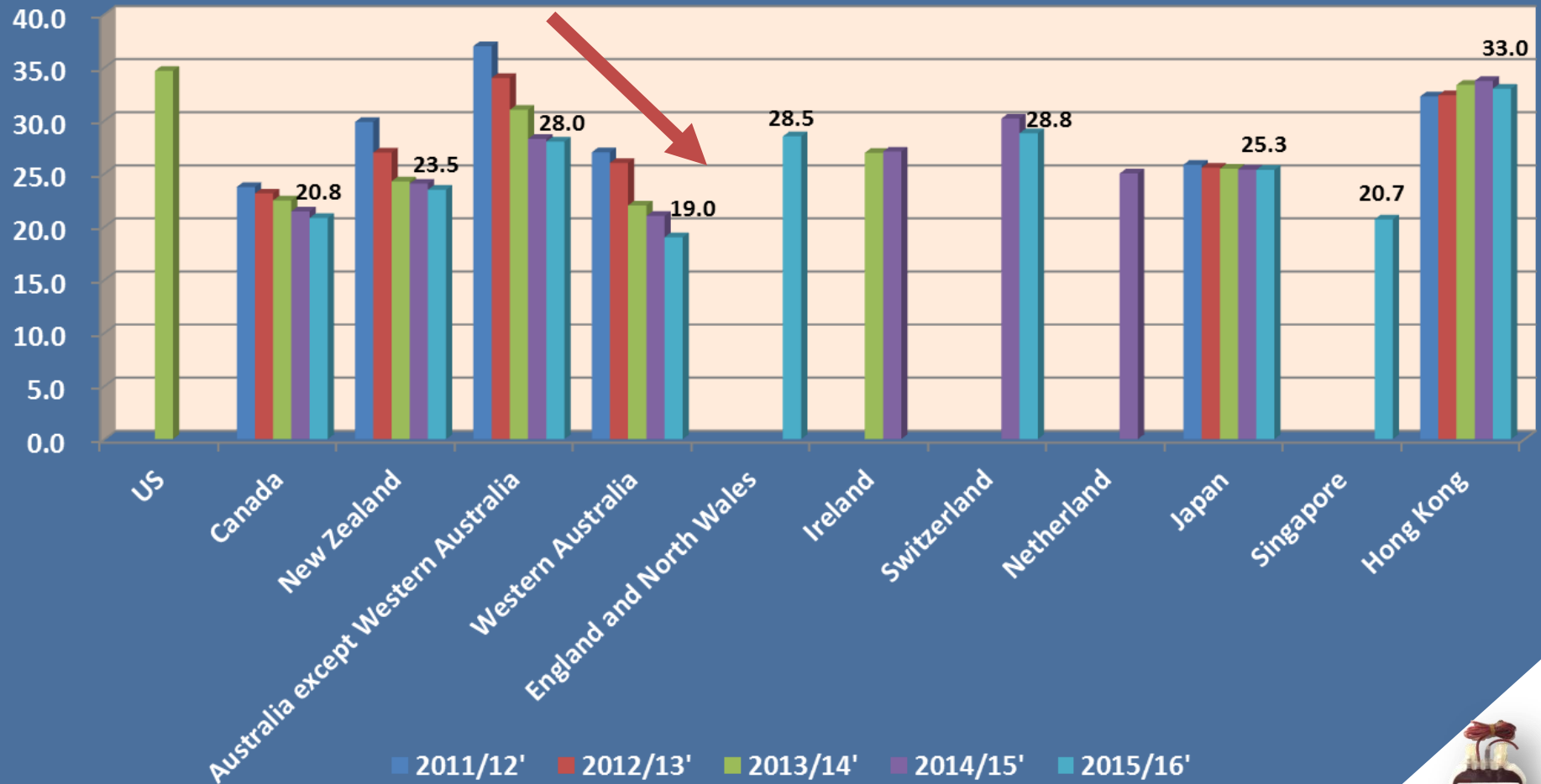
- **To improve patients' outcome**
- To reduce frequency and number of blood transfusion, the risk from blood transfusion
- (May slow down increasing rate or even revert the growth; more time to plan and work out better strategies to cope with health issues from ageing population)



**Every blood donation
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Trends in red cells usage in countries implemented PBM

Red Cell Use per 1,000 Population



Every blood donation saves 3 lives

FIGURE 1: SIGNIFICANT DECLINES IN BLOOD UTILIZATION

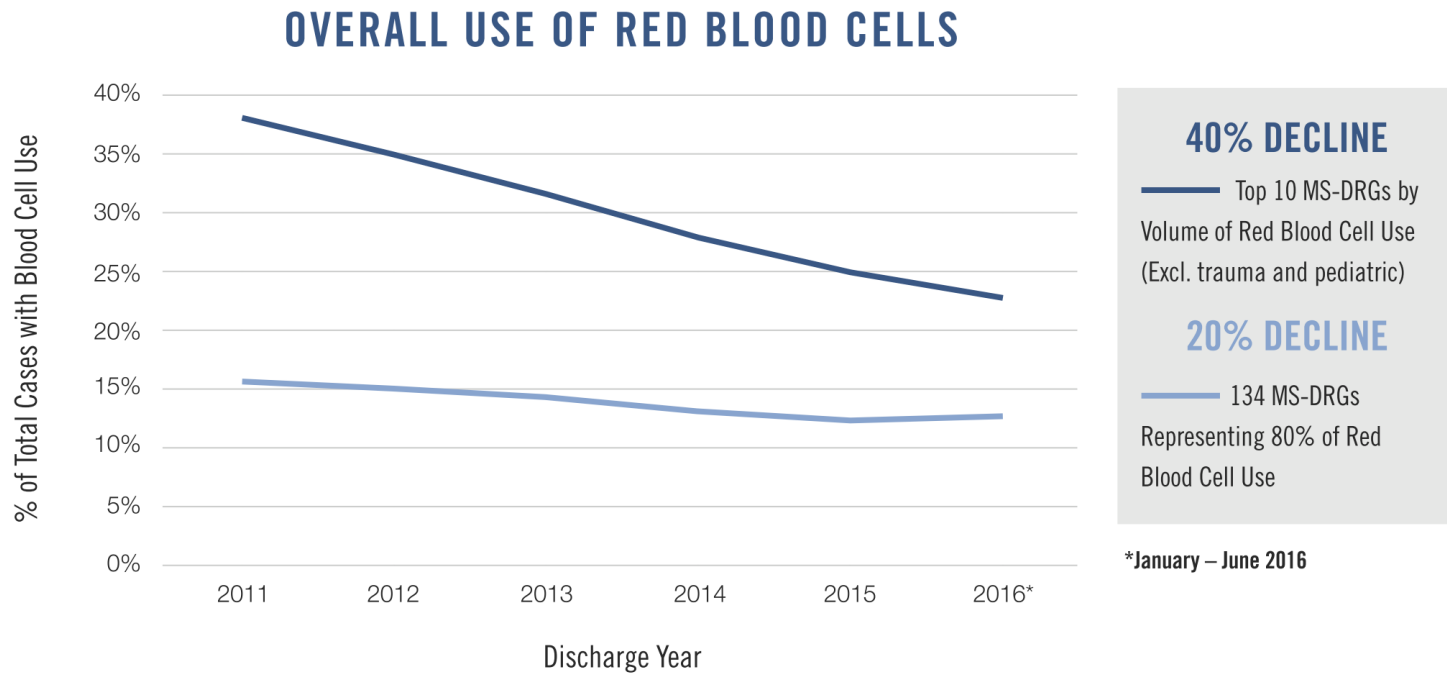


FIGURE 2: SHIFTS IN BLOOD UTILIZATION AMONG PROCEDURES

PROCEDURE	PATIENTS RECEIVING BLOOD 2011-2016
Major Joint Replacement without multiple chronic conditions	↓ 72.4%
Hip and Femur Procedures except Major Joint with chronic conditions	↓ 28.4%
Major Small and Large Bowel Procedures with multiple chronic conditions	↓ 23.8%
Red Blood Cell Disorders without multiple chronic conditions	↓ 15.3%
Red Blood Cell Disorders with multiple chronic conditions	↓ 7.0%



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Now, to get aware of PBM and
makes our changes



**Every blood donation
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PBM in Hong Kong

– today and tomorrow

1. **Awareness and Education** (in particular two area – latest PBM development and iron deficiency anaemia management)
2. **Problems Identification** among their specialties
3. **Programme Development** to implement PBM according to their patients characteristics and needs
4. **Transfusion Practices change NOW**
5. **Experience sharing**



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Awareness and Education

- **Aims to drive for better patients outcome**
- Blood supply is not unlimited
- Blood Transfusion carries risk
- Transfusion Alternatives are available
- **Our Professions should be made themselves aware of PBM NOW, just like they know medical advances**

(Professional bodies, HA/Hospitals Management, Universities, Public & Government)



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PBM initiatives

- Potential area of issues and interests have been identified by selected groups of professions in Hong Kong (today is small)
- Worth to have their results to share among professions and relevant stakeholders
- Also learn from overseas experience



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saves 3 lives**



24 – 25 April 2018



Every blood donation
saves 3 lives

From today onwards



**Every blood donation
saves 3 lives**

Patient Blood Management is not something difficult to learn and implement. Rather it is more a process to get aware and execute our professionalism based on evidence in delivering better patients care.



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Conclusion

- Blood supply in Hong Kong is currently in significant difficulties that works must be done immediately at both supply and demand simultaneously.
- Patient Blood Management should be implemented locally for ensuring better patients' outcome with possibility of slowing down blood demand increase.



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Thank you



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