Patient Blood Management – the Future in Hong Kong

Dr CK Lee
Chief Executive & Medical Director





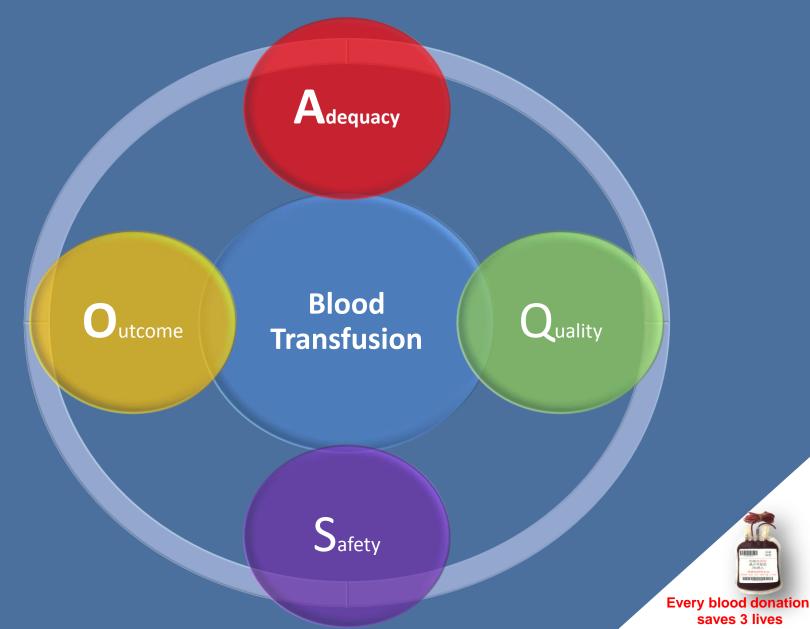
Why ME? Why NOW?

- 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.)

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.

Let re-focus at blood transfusion



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

Report Universal Blood Transparent Process



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

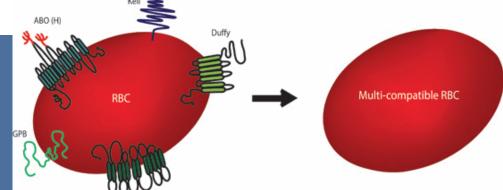
gene editing

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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

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	



World First Case of Transfusion Transmitted Japanese Encephalitis reported on 21/07/2017

輸血染日本腦炎 全球首例



[明報專訊]本港確診全球首宗經輸血感染的日本攝炎,衛生防護 中心昨追查發現,受感染的換肺病人上月在瑪麗醫院輸入學病毒的 紅血球,現情况非常危殆。來自日本顯炎感染者的血包共輸給3名 病人,另外兩人中一人已因脳出血死亡,難以追查有否感染,另-人则需输血確認、粉末發现病徵、基於现在未有緊血包大規模條約 日本販売的測試方法。紅十字會輸血服務中心指本港血庫不會寫此

病人服抗排斥藥 減免疫力 - 個家但大可能是本地感染、食糧署 會在其住虛附近加強減較、其住所

產數提賣關價內本報表示。哲未分 析帶日本廠炎血液樣本的病毒量。 日本腦炎病毒可存在於白血球,而

此不摂血・両防止日本脳炎進入血 哀國男表示・今次是全球首宗領 舞曲心的姿态者。球场日本期季的 哲香日本指导的指表方法。「相似 结果發現瑪麗響院1個血液樣本及 一人出現病微,亦可能没有發燒 對日本腦炎星陽性反應,其中順則 算,全進可能有300人受感染。但

例侧隔性標本同來自一名於5月 出300名感染者十分難。如日後有 29 目刮血的 46 成男子,其紅血球 粉上月 22 目输给今次受感染的换排 病「再考慮」 病人。該名刮血者所割的血漿及血 植門可利用昨日追頭病人的輸血 小板能给另外兩人,當中一名顯出 方法爲熱器官病人驗血包、哀向本 血病人已死亡。另一名血癌病人未 報告因逐個樣本檢測,工作量十分 規約內公元上 見前徵(**見表**)。袁國男稱·死者 大。 有否受感染維迫查·另一名病人器 12日方確診 袁:好假才能斷症

初血者居於天水湖嘉湖山莊·本 全世界無聲生過輸血染日本攝炎 身被無病徵、捐血前費到過不屬於 醫生葉 好網 才能懈能、賴人輸 日本服炎流行地區的英國倫敦、巡 血被發能及神志不清。即取其會權 海梯在觀測工作,亦無印象份被較 液测效,「基否可以快一點?可能 可,其同住的妻子並無不適。衛生 将努力可早12小時,但早歲日就無 防護中心總難實加壓表示。相血者 可能」。

香港大學微生物學系傳染病學講 所公里手匹鞋間內亦無稱場。 筛查血库 靠看指血者病歷 **数据加强内容的结构或自未服务**

初血者無病微「無印象被蚊叮」 開来,是否是了测试、哀阅男告 WHEN AN A SERVICE OF THE SERVICE STORY.

-	The second second	香迷病人
接受血製品		
6月22日在瑪麗 輸入紅血球	6月2日在瑪麗 輸入血小板	6月20日在伊利 沙伯輸入血漿
血製品帶日本服	炎病毒可能性	
病毒在白血球 中,而紅血球有 機會帶有白血球		血糖帶病毒機會 低
現時情况		
確診日本編炎・ 情况危险	警啶紀錄上無病 徵・7月14日 競・與抽血化驗 確認有無感染日 本腦炎	理想:7月4日

7月8日 挑粉病人服里神志不清及抽搐 7月9日 换新病人抽筋昏迷

疑含日本腦炎血製品輸予3人情况

全球首宗經輸血感染日本腦炎事件領 With 血,他不知自己染上日本腦炎,亦無病 做,他捐的血分別製成紅血球、血小板 6月22日 上述損血者的紅血球輸給52歲換肺男 截上

7月6日 换新病人再接受输血。出现發燒及神志 不達

資料來道:衛生助護中心、紅十字會輸血服務中心

HEALTH

HK man contracts Japanese encephalitis via transfusion

I hope this case

donating blood

PROFESSOR YUEN KWOK-YUNG, HKII

the general

public from

won't discourage

World's first such case puts focus on city's donation policy, but expert sees no cause for public alarm

Nikki Sun and Emily Tsang

Hong Kong health authorities are tackling the world's first case of a patient contracting the potentially fatal mosquito-borne disease, Japanese encephalitis (JE), through a blood transfusion.

The 52-year-old man was fighting for his life at Queen Mary Hospital yesterday.

Doctors had determined that two others received the same infected blood as the patient, who underwent a lung transplant at Oueen Mary in May. followed by a blood transfusion at Grantham Hospital two weeks ago.

Doctors said the other two patients had not shown any symptoms, though one of them died of a brain haemorrhage after undergoing surgery earlier

While the globally unprecedented case put the focus on the city's current blood donation policy, which does not require testing for JE, health officials ruled out changing the system.

University of Hong Kong microbiologist Professor Yuen Kwok-yungsaid there was no need to start screening blood donations for JE as the chance of infection was very low.

"This is a very rare and unfortunate case," he said, adding that the lung transplant operation could have made the patient more vulnerable to the JE virus.

"From a medical point of view, I don't see the need to develop a mass screening test, unless there is

a surge in the cases of JE virus infection in Hong

There have been only three cases of the disease this year, and only one in 100 infected people show symptoms such as headache, high fever and neck stiffness, usually four to 14 days after contracting the virus. It may lead to a swelling of the brain and death.

Yuen added that it was practically impossible to check the Red Cross blood bank for the JE virus, and there was no need for public alarm.

"I hope this case won't discourage the general ublic from donating blood in future," he said.

There are records of similar mosquito-borne viruses spreading through blood transfusions or organ transplants.

Dr Lee Cheuk-kwong of the Red Cross suggested that in addition to filling in questionnaires regarding their health, donors should report any symptom of illness after giving blood.

Investigations revealed that the donor, a 46-yearold man living in Tin Shui Wai and working in Kwun Tong, had given blood through the Red Cross mobile donation service on May 29. He had passed all required health tests and showed no symptoms of JE.

The donor visited London in May but could not recall if he had been bitten by mosquitoes. Centre for Health Protection controller Dr Wong Ka-hing said there was a very high chance he had been infected

The patient suffering from brain haemorrhage received the infected blood on June 20, and died after surgery on July 4 due to bleeding. He was not tested for JE, but did not show symptoms of the virus either.

Another patient being treated for leukaemia at Oueen Mary underwent a transfusion with the infected blood on June 2, but was discharged on July 14 without showing any IE symptoms.



Every blood donation saves 3 lives

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

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

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 transfusionassociated complications.

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;
- 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.

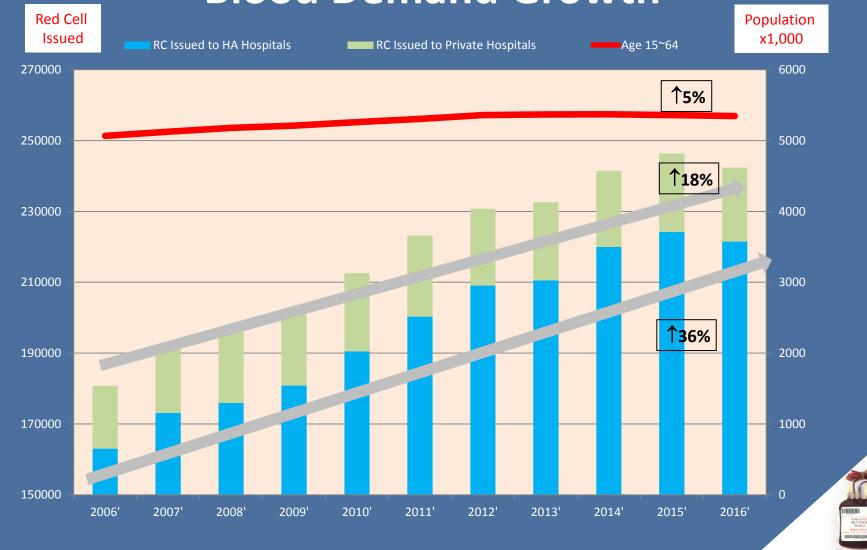
What are the Issues in Hong Kong Now?



Blood Supply NOW encounters significant difficulties!

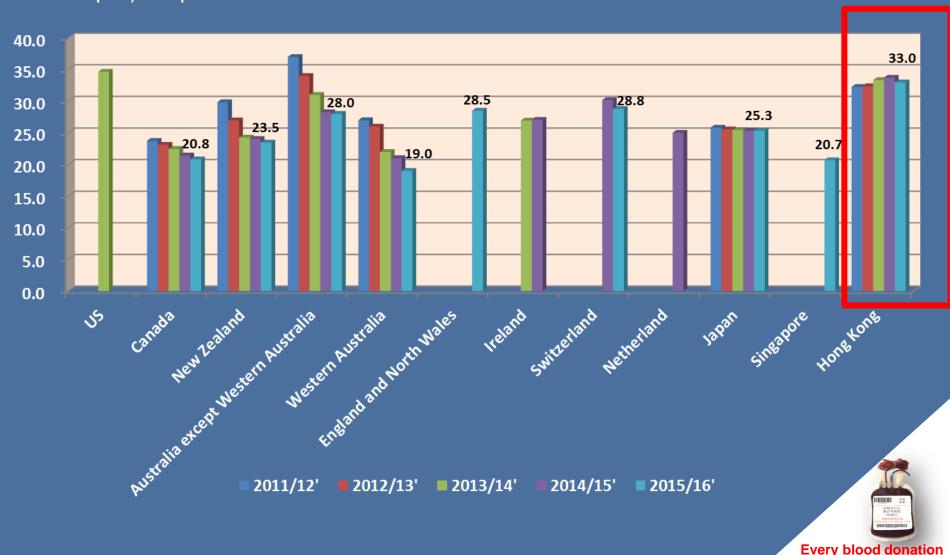
- Poor responses of the public to recruitment and publicity
- High deferral risk due to low pre-donation haemoglobin (iron deficiency) and others in particular travel history risk
- Impact of weather in particular typhoons and cold weather
- Rumours that blood exported outside HK and used in non HK residents

Donation Population Growth vs
Blood Demand Growth



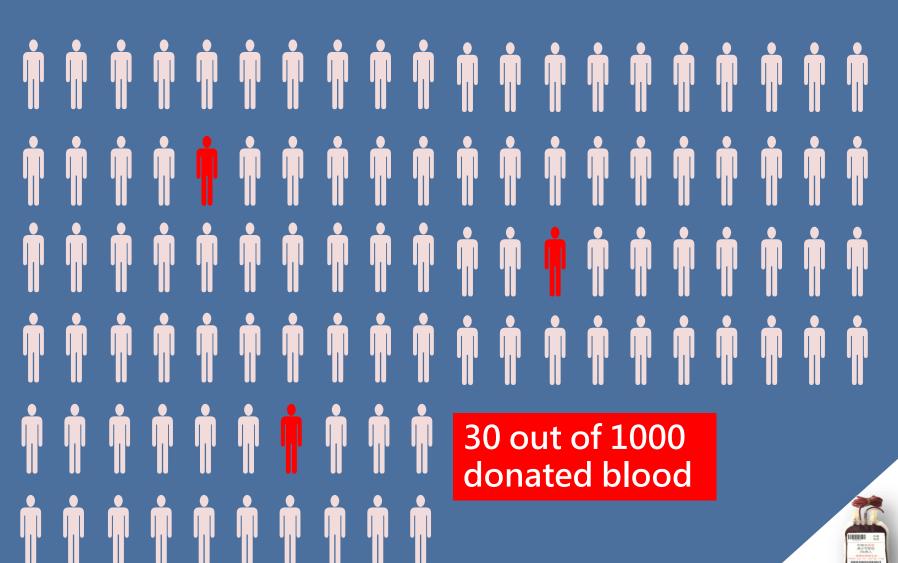
Hong Kong is using more blood than other developed countries





saves 3 lives

Theoretical Donors Pool*



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).

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

香港紅十字會輸血服務中心

太工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 千人次成功捐血,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 改變主接觸捐。提會減少,亦與 捐血態度改變有關,認為不少學生未能了 解捐血意義對於上年有該言語被轉贈,但 地,李強調「所有血液未曾離開香港」, 地,李鐵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



	2016年	2017年(百分比
	血液收集	
參與捐血人數	328,318人次	312,972人为
成功捐血人次	258,222人次	244,653人为(-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
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
合共	494,672單位	487,094單位

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

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 8 Feb 2018
BTS Annual Press Conference Low blood inventory
Less young donor
High deferral due to low Hb
and iron



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

,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

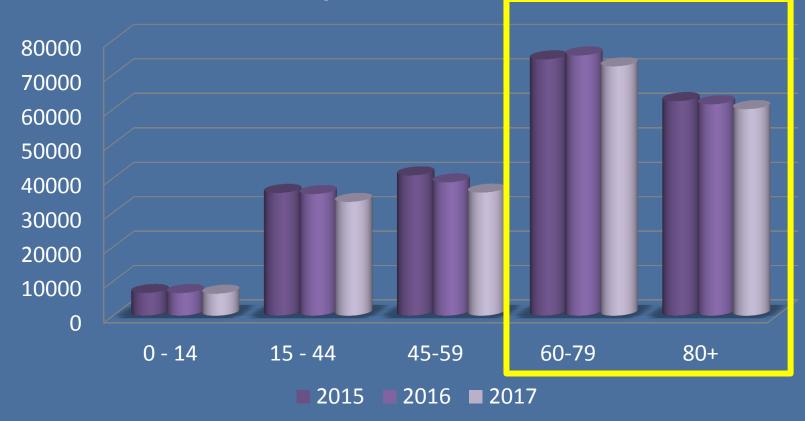


記總人數為三十一萬二千人, 究學校捐血情況,令更多年輕

喻血服務中 制改變,令學生在中學階段接 心昨表示,去年捐血登 觸捐血機會較少,中心會再研



Blood usage in HA (90% territory wide consumption)

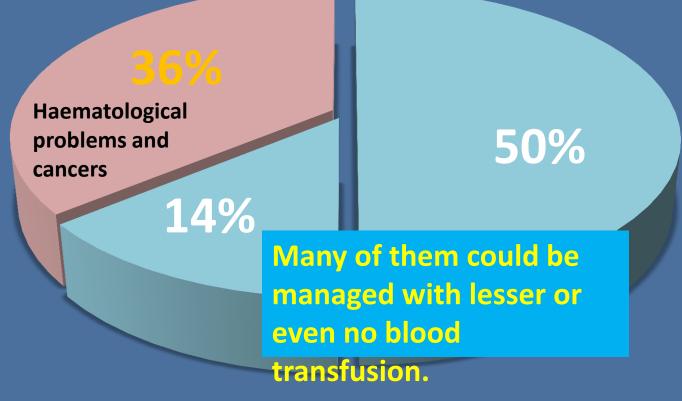


63.7% in patients aged 60 or above; 28.8% in 80 or above



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%)



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.

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



13 註:不包括外籍家庭傭工

人口(百萬人)

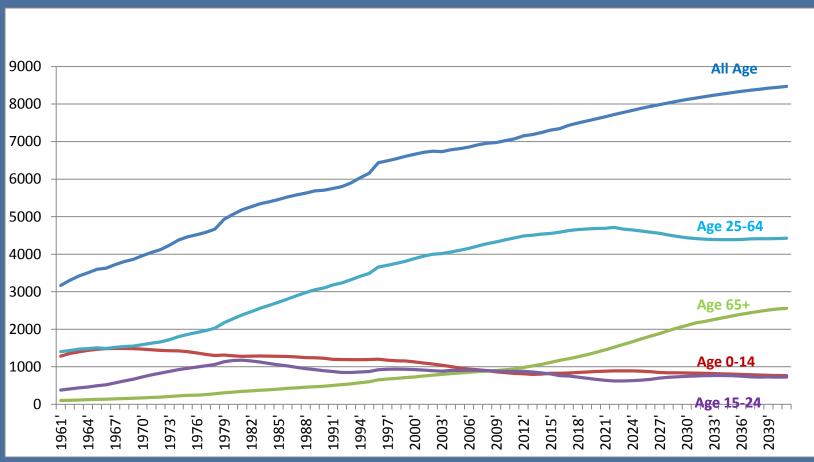
Note: Excluding foreign domestic helpers





Rapidly Ageing Population

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



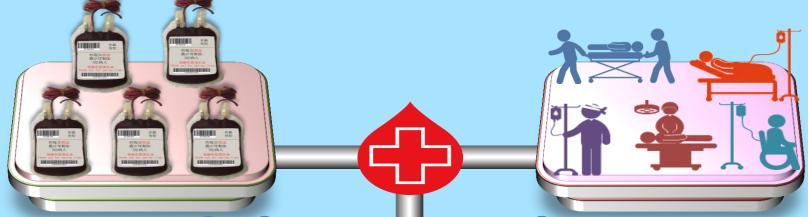
Our Ongoing Challenges -Ageing is getting worse Sustainability of our Blood Supply will be even worse if no change in blood transfusion happens

Voluntary donation with eligibility Shelf life Avoid Expiration ,,,,

Supply

Not easy predicted Outcome driven,,,

Demand



Sustainability must be ensured and properly addressed

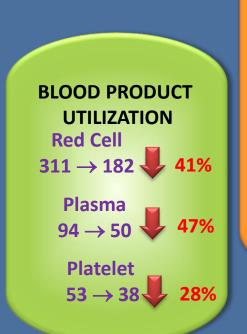
BTS is responsible for blood collection, processing and testing BTS supplies blood to hospital blood banks which distributes blood for patients requiring transfusion

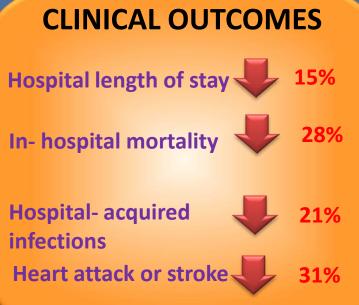
Patient Blood Management to enhance patients' outcome and slow down demand growth



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)





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.

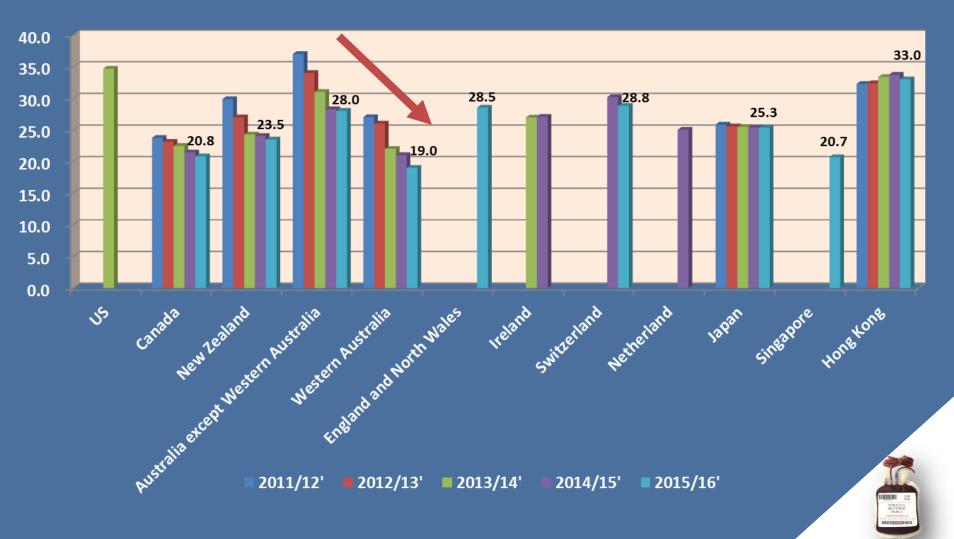


Hence, PBM definitely works

- 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)

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

OVERALL USE OF RED BLOOD CELLS

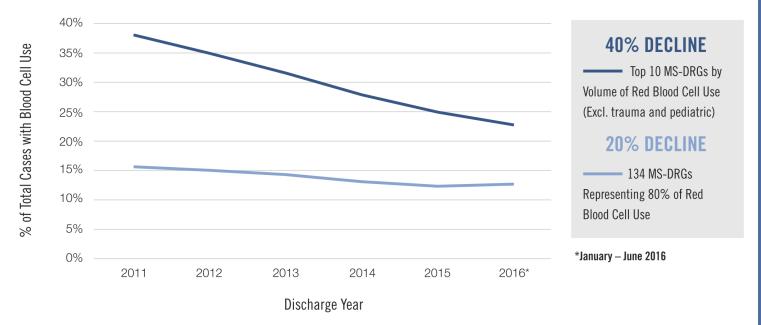


FIGURE 2: SHIFTS IN BLOOD UTILIZATION AMONG PROCEDURES

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%

Now, to get aware of PBM and makes our changes



PBM in Hong Kong

- today and tomorrow
- 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



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)



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





From today onwards



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.



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.

Thank you

