Blood safety contribution of deferral for TTI-risk behaviour

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Australian Red Cross
BLOOD SERVICE

Overview

- Safety contribution of donor education/selection
- Deferral policies
  - General principles
  - Limitations
- Non-compliance
  - Australian non-compliance study
  - International non-compliance among to MSM
  - Motivations and strategies to reduce non-compliance
- Test-seeking behaviour
- Cost-effectiveness of DHQ
- Take home messages

Risk minimisation strategy

Four complementary processes (‘tiers’) safeguarding the blood supply from transfusion-transmissible infections (TTIs)

- Community and donor education - which leads to self-deferral
- Donor selection (deferral at donation)
- Testing
- Pathogen inactivation

Proportional safety contribution

What is the risk reduction contribution in Australia of each ‘tier’ for screened TTIs?

- Estimate combined population prevalence of HIV,HCV and HBV
  - 2,411 infections per 100,000 population (2013 Australian National Surveillance data – Kirby Institute)
- Combined prevalence of HIV,HCV and HBV in Australian donations
  - 18 infections per 100,000 tested donations (2013 Blood Service TTI Surveillance Report)
- Combined prevalence reduction - 134x (2411/18) - impact of self-deferral and deferral by ‘donor selection’ (Donor Questionnaire)

Impact of eligibility criteria

- Currently about 99.3% prevalence (or ‘TTI infectious risk’) reduction attributed to self deferral and interview- based deferral
- Approx. 0.7% remains which is mitigated by testing and any residual (<0.01%) potentially by PI (for fractionated plasma only in Australia)
- Current residual risk for fresh components – approx. 1 in 538,000 per unit transfused for HIV,HCV and HBV combined (http://www.transfusion.com.au/adverse_events/risks/estimates)

What if we accept anyone as a donor?

- Testing now has to mitigate >99.3% TTI infectious risk
- Residual risk increases from 1 in 538,000 to approx. 1 in 10,000 per unit transfused
- Due to increase in donors attending with undetected prevalent and incident infections - who would previously have self-deferred or been deferred at donation
- **So** – despite state-of-the-art testing (HIV/HBV/HCV ID-NAT in Australia) optimal donor education/selection measures remain an important safety plank!

The role of donor deferral policies

Deferral – temporarily or indefinitely restricting donors from donation

Rationale – donors in the WP (i.e. with very recent infection) cannot be interdicted by testing as they will test negative

- Mechanism - include specific 'screening questions' in the donor questionnaire (DQ) targeting behaviour(s) associated with increased risk of harbouring/acquiring TTIs

- Efficacy supported by increased prevalence of viral infections among donors deferred for risk of viral hepatitis (Zou *Transfusion* 2006)

however - lacks specificity (i.e. WP donors rarely detected and many low risk donors needlessly deferred) (de Kort. *Transfusion* 2014)

General limitations of deferral questions

- Understanding
  - Questions must be concise and unambiguous
  - Understanding may be limited by first language
- Donor recall
  - Not always complete
  - Usually more precise for recent behaviour
- Compliance
  - Requires full and frank disclosure
  - Transparency - donor must answer to the 'best of their knowledge'
  - Failure to disclose TTI risk behaviour can lead to recipient infection
  - Rare cases reported despite NAT (e.g. HIV transmissions in USA – *MMWR* 2010 and Japan - Shinohara et al. Vox Sang 2014) – not reported in Australia to date

Optimal safety relies on 100% compliance!

Non-compliance

Non-compliance = 'Disclosing something later that would have lead to deferral if disclosed at the time of donation'

- Non-compliance rates
  - Rates in TTI test positive donors
    - 25% (UK)12-25% in Australia (2008-2012)
  - Rates in TTI test negative donors
    - MSM (male-to-male sex deferral question)

    Indefinite deferral – 0.7-2.6% (studies in male donors from USA, Canada, China)

    12 month deferral – 0.2% (Australia)
    - History of IDU

    0.15% (Canada), 0.2% (China), 0.36% (Australia), 0.51% (USA)

    - Sex worker contact (12 month deferral)

    0.05% (Australia), 1.7-2.4% (China)

MSM deferral in Australia

- 1984 Permanent deferral for any male-to-male sex commenced in Australia – risk factor for HIV/AIDS
- 1992 Non-binding recommendation for 12-month deferral – primarily based on efficacy of 3rd Gen HIV testing
- 2000 Current 12-month deferral nationally applicable (and NAT)
- 2010 Retrospective Australian study (Seed CR, Keller AJ et al. *Transfusion* 2010; 50: 2722-30)
  - HIV transmission risk did not increase significantly after 12-month deferral implemented
  - **'Compliance' to the deferral more influential on HIV transmission risk than duration of deferral**

    (subsequently supported by modelling of Davison et al. Vox Sang. 2013)

2012/13 compliance survey[1]

Male respondents = 14,706

Number ‘yes’ (i.e. ‘non-compliant’) responses = 34

Non-compliance rate	34/14,476
	0.23% (95% CI; 0.16-0.33)
Non-compliant within 6/12	24/14,476
	0.17%

No statistical difference in non-compliance rate between first-time (0.16%) and repeat donors (0.24%)

1. Seed CR, Lucky TT, Waller D, et al.: Compliance with the current 12-month deferral for male-to-male sex in Australia. Vox Sang. 2014;106: p. 14-22.

Factors associated with 'non compliers'	Adjusted Odds Ratio (CI)	P value
Age - Compared to donors <30 years		
30-49 years	0.1 (0.03-0.31)	<0.001
>50 years	0.19 (0.07-0.52)	0.001
Education – Compared to high school or greater		0.007
Lower level than high school	4.05 (1.47-11.18)	
Perception about 'personal' questions asked on DQF		
Questions 'too personal'	6.76 (1.22-37.34)	0.028
Privacy while answering questions in the DQF at his/her last donation		
Privacy insufficient	6.99 (2.56-19.11)	<0.001
Comfortable raising questions with interviewers		
Uncomfortable	4 (1.7-9.38)	0.002
Preference for a computer-based questionnaire		
Prefer computer-based questionnaire	2.92 (1.36-6.24)	0.006
Injecting drug use (IDU)		
Donors with history of IDU	4.05 (1.47-127.52)	0.024
Number of sexual partners in 12 months prior to last donation (one or none)		
2-4 partners	10.54 (4.54-24.46)	<0.001
>5 partners	9.87 (3.02-32.33)	<0.001

- Multivariate logistic regression model
- All surveyed factors included in modelling

Seed CR, Lucky TT, Waller D, et al.: Compliance with the current 12-month deferral for male-to-male sex in Australia. Vox Sang. 2014;106: p. 14-22.

Key Findings

- Low (0.23%) non-compliance rate to current 12-month male-to-male sex deferral in Australia
- Slightly higher rate in repeat donors but not statistically significant
- Majority of non-compliers (24/34) had deferrable ‘contact’ within 6 months but 10/34 would become ‘eligible’ under a 6-month deferral

Non-compliance associated with:

- Older, less educated donors with multiple sexual partners
- Donors perceiving questions are ‘too personal’ and those uncomfortable raising issues with assessors
- Donors with history of IDU

Compliance assessed in male blood donors

Country or Setting	Percent Noncompliance
Australia[1]	0.23
Canada[2]	0.8 – 1.4
Hong Kong(2013-2014)[3,4]	1.5-2.3
USA(2014)[5]	2.6
USA (1993)[6]	0.7
USA (1998)[7]	1.2

[3] Wong, Transfusion, 2015
[5] Custer, IPFA-PEI, 2014
[1] Seed, Vox Sang, 2014
[2] Goldman, Transfusion ,2011
[3] Lee, Transfusion, 2013
[6] Williams, JAMA, 1997
[7] Sanchez, Transfusion, 2005

- Lowest in Australia – only study where temporary (12 month) deferral applied
- Inconclusive - but suggestive of better compliance for time-limited deferral

Strategies to reduce ‘non-compliance’

- Evidence-based policies – perceived as ‘equitable’ and defensible
- Unambiguous screening questions
- Private and confidential interview environment
- Non judgmental assessors
- Computer based questionnaires – evidence they favour disclosure among non-compliant donors

Questions

Is there a minimum achievable non-compliance threshold?

Will some individuals fail to comply no matter what?

‘Test Seeking’ behaviour

Test seeking = donation for the primary purpose of infectious disease testing

- Poses a risk given the possibility donor is in the WP
- Internationally recognised phenomenon – most studies on HIV test-seeking
- Motivation for a minority of donors – 4.3% in meta-analysis (Bednall & Bove *TMR,* 2011)
- Intuitively - predict lower rates where public health testing freely available (like Australia)

HIV test-seeking rates among donors

Country (year)	Percent Test Seeking
Australia[1]	0.4
Zimbabwe[2]	2
Norway[3]	3
Hong Kong[4]	6
USA[5,6]	3-15
Brazil[7,8]	2.7-9

[1] Lucky, Transfusion, 2014
[2] Mvere, Lancet, 1996
[3] Stigum, Transfusion, 2001
[4] Lau, AIDS care, 2002
[5] Doll, Transfusion, 1991
[6] Sharma, Transfusion 2001
[7] Goncalez, AIDS Behav, 2008
[8] Truong, AIDS Behav, 2015

- Study methods highly variable –difficult to compare rates
- Substantial variation between countries

HIV ‘Test Seeking’ in Brazilian donors

- Extensively studied – 7-14% donate primarily to access HIV testing
- High rate -despite freely available HIV testing at public clinics
- HIV prevalence in community donors> replacement donors – unexpected ?test-seeking in community donors
- Motivation – primarily associated with dissatisfaction with prior alternative testing experience (Truong et al – *AIDS Behav* 2015)

Question – can offering HIV testing and counselling at time of donation reduce ‘test-seeking’ non disclosure and associated risk?

ORIGINAL RESEARCH

Does offering human immunodeficiency virus testing at the time of blood donation reduce transfusion transmission risk and increase disclosure counseling? Results of a randomized controlled trial, São Paulo, Brazil

Thelma T. Goncalez,[1] Paula F. Blatyta,[2] Fernanda M. Santos,[2] Sandra Montebello,[2] Sandra P.D. Esposti,[2] Fatima N. Hangai,[2] Nanci A. Salles,[2] Alfredo Mendrone,[2] Hong-Ha M. Truong,[3] Ester C. Sabino,[4] and Willi McFarland[3,5]

TRANSFUSION 2015 doi:10.1111/trf.13009

Unexpected negative findings

'Conclusion – offering HIV counselling and testing at the time of donation would not change the risk of contamination in the blood supply, nor improve results disclosure and referral to care'

ORIGINAL ARTICLE

Cost-effectiveness of questionnaires in preventing transfusion-transmitted infections

Wim de Kort, Peter van den Burg, Herman Geerligs, Pieternel Pasker-de Jong, and Tanneke Marijt-van der Kreek

Transfusion. 2014;**54**: p. 879-888.

- Dutch study assessing cost-effectiveness of DHQ in preventing TTIs
- Modelled the number of donors attending in the WP
- Calculated incremental cost-effectiveness ratios (ICER) using costs/savings and QALYs

Cost-effectiveness of DHQ (cont)

- ICER for DHQ in preventing TTIs
  - 696,000 euro for Blood establishment costs only
  - 1.4 million euro including costs for deferred donors
- **Conclusion** – in the Netherlands the DHQ is not cost effective tool for further reducing TTIs

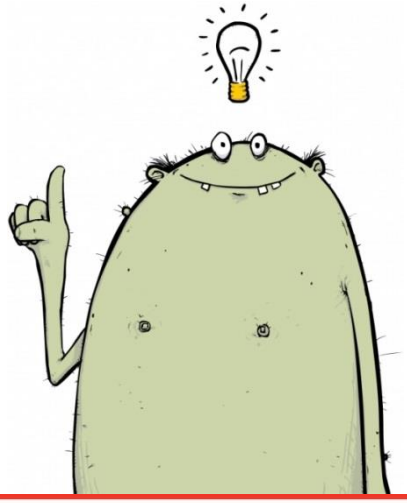
However

DHQ should not be abandoned – enhances ‘self-selection’

Goal - optimise and reduce the number of questions (19 TTI-related in the Netherlands)

Take home messages

- Despite state-of-the-art testing optimal donor education/selection measures remain an important safety plank
- Deferral of donors for TTI-risk behaviour(s) is highly effective but has limitations
  - Lack of sensitivity (poor yield) and specificity (unnecessary deferral)
  - non-compliance (0.2-2.6%)
  - ‘test-seeking’ (0.4-15%)
- Overall - DHQs likely not cost-effective (CE)
  - But important to retain - optimise donor selection
  - Challenge – fine-tune questions to enhance efficacy/CE



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