Impact of MSM donor deferrals on safety and supply

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People (scientists, managers, economists, consultants) love to measure what they can, and often think they are measuring what they should.

If there’s something you can measure that’s close to what you are trying to quantify, then it’s easy to convince (everyone) that you’re doing something useful and important.

Instead, by measuring a proxy and pretending (to yourself) that it’s the real thing, you are quite possibly undermining your own intent.

Uncertainty is a real thing, like mathematics – proxy measurements do not diminish it. But it can be engaged, even if it can’t be abolished.
(in the West) there is no HIV issue with MSM donating after 1 year’s abstinence (but not because of what you think)

The emerging infection issue is real – the San Andreas fault of haemophilia treatment; there may be workable solutions, but pretending it isn’t there isn’t one of them

The compliance issue is irrelevant
## MSM Deferrals

<table>
<thead>
<tr>
<th>12 Month Deferral</th>
<th>5 Year Deferral</th>
<th>Lifetime Deferral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Canada</td>
<td>Austria</td>
</tr>
<tr>
<td>Brazil</td>
<td>New Zealand</td>
<td>Belgium</td>
</tr>
<tr>
<td>Czech Republic (?)</td>
<td>Behavioral</td>
<td>China</td>
</tr>
<tr>
<td>Hungary</td>
<td>Argentina</td>
<td>European Union (?)</td>
</tr>
<tr>
<td>Japan</td>
<td>Italy</td>
<td>France (under review)</td>
</tr>
<tr>
<td>UK (ESW only)</td>
<td>Mexico</td>
<td>Germany</td>
</tr>
<tr>
<td>US (date TBD)</td>
<td>Poland</td>
<td>Ireland (under review)</td>
</tr>
<tr>
<td>Canada</td>
<td>Russia</td>
<td>Netherlands</td>
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<tr>
<td></td>
<td>South Africa</td>
<td>Switzerland</td>
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<tr>
<td></td>
<td>Spain</td>
<td>UK (NI)</td>
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<tr>
<td></td>
<td></td>
<td>US*</td>
</tr>
</tbody>
</table>
Moving from lifetime to something else—did it make a difference?

To what?

Supply of labile blood products—probably not

Plasma for fractionation—almost certainly not

To safety?

Of what?
What determines blood safety?
There are five parts.

The MSM deferrals affect only one of them.

As it turns out.
Part 5

The World – the global ecology of blood and plasma.

The emergence of infections (but particularly some infections more than others), and the emergence of technologies to deal with them.

Massive engagement with this part results in things like gene therapy, recombinant proteins and small molecule therapies.

It also leads to cold war engagement with emerging and present threats: surveillance, curtailment, damage limitation, cellularity, early adoption of technological advances to deal with threat rather than disaster.
Part 4

PI – sterilisation. Is much more effective than testing or donor selection, which are simply supports of moderate effectiveness that are essentially redundant (though no-one is seriously suggesting stopping them, yet)
Part 3

Testing. Very effective for known viruses. Effectiveness diminishes in proportion to test pool size, when testing for individual donor infections. Why anybody thinks pooling for testing for individual donor products is appropriate is beyond me. HIV transmissions from ID NAT negative donations are not impossible, but are vanishingly rare. Effective risk period is probably around 2 days.
Part 2

Donor selection strategies at clinic/sessions/blood drives

No data on effectiveness, but for current HIV and emerging infection risk probably not effective at all. Even if they were 90% effective they would be effectively useless for ensuring safety, especially for a pooled product.
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Donor selection strategies at clinic/sessions/blood drives

No data on effectiveness, but for HIV and emerging infection risk probably not effective at all. Even if they were 90% effective they would be effectively useless for ensuring safety, especially for a pooled product. (Nobody uses this as a stand alone strategy if they can avoid it.)

This is where it is generally believed that MSM deferrals work – the ability to turn away at risk donors who present at blood drives to donate blood.

But it isn’t ........

There are no data that quantify the effectiveness of this activity – but plenty of data to indicate that it more or less useless when stressed: a roof that only leaks when it rains.
Part 1

Donor demographics. This is the major contributor to risk in the absence of effective ID NAT and sterilisation. It is also how you can measure whether a change in deferral has affected residual risk. (If the sample is large enough.)

This is where VNRD works when it works.
Total eligible population by age only (18-70)

N = 2,000,000

HIV Infections n = XXXXX
P = n = 125

MSMs
N = 70,000

HIV Infections n = YYYY
P = n = 125
Total eligible population by age only (18-70)

N = 2,000,000

HIV infections n = XXXXX
WPI n = 125

MSMs
N = 70,000

80,000 donors passing the IBTS screening process

HIV infections n = 1
WPI n = unknown

MSMs
N = unknown

Estimate from other countries—MSM may be 0.05% overall: n = 50. The relative reduction in HIV+ or WPI is unknown; maybe considerably greater, or even less, than 1.
20 x filter:

Culture
Compliance
Information

Who crosses through, who doesn’t?

What affects this: lifestyle, age, education, social background, place of residence?

How effective is it in reducing the neutrino effect of WPIs?

Does it reduce WPIs and HIV + in equal proportion to each other, and in what proportion to the general population?

Is this a major defence against WPIs?

0.8 x filter:

HLQ, Interview (Rules)

Compliance (Skill)

Effect unknown: some get through, as detected by non-complying HIV + donors (50% of test +), but the number of HIV + presenting to this barrier is unknown – effect of filter on HIV + or WPIs may be zero

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Tests: Single donor NAT

No effect on WPIs
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No effect on WPIs
We do not know how this works, or what effect a change in the ban will have on it, but it may be all that protects against WPIs.

WPI REDUCTION EFFECT

0.8 x filter: HLO, Interview (Rules)

Tests: Single donor NAT

No effect on WPIs

Compliance (5k Hi)

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**WPI REDUCTION EFFECT**

HLQ/screening effect on WPIs unknown; at best less than 100% effective; at worst 0% effective

We do not know
Prevalence in total population v prevalence in presenting population v prevalence in post-HIQ population?
What difference does changing the MSM ban make?

We do not know how this works, or what effect a change in the ban will have on it, but it may be all that protects against WPIs.

Pathogen inactivation

20 x filter:

- Culture
- Compliance
- Information
- Who crosses through who doesn’t?
- What affects lifestyles, social practices?

What is the neutrino effect of test seeking/money seeking/fraud?
Tests: Single donor NAT
No effect on WPIs

WPI REDUCTION EFFECT

HLQ/screening effect on WPIs unknown; at best less than 100% effective; at worst 0% effective

We do not know Prevalence in total population v prevalence in presenting population v prevalence in post HLQ population?
We do not know how this works, or what effect a change in the ban will have on it, but it may be all that protects against WPIs.

**WPI REDUCTION EFFECT**

HLQ/screening effect on WPIs unknown; at best less than 100% effective; at worst 0% effective.

We do not know Prevalence in total population vs prevalence in presenting population vs prevalence in post-HIQ population.

The neutrino effect of test seeking/money seeking/fraud.
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We do not know how many or what effect a change in the ban will have on it, but it may be all that protects against WPIs.

Pathogen inactivation

None

WPI REDUCTION EFFECT

Tests: Single donor NAT

No effect on WPIs

Prevalence in total population vs. prevalence in presenting population vs. prevalence in post-HIQ population?

We do not know how this works, or what effect a change in the ban will have on it, but it may be all that protects against WPIs.

HLQ screening effect on WPIs unknown; at best less than 100% effective; at worst 0% effective.

None

0.8 x filter

Interview (Rules)

Tests: Single donor NAT

the neutrino effect of test-seeking/money-seeking/fraud

No effect on WPIs

Not much

None
We do not know how this works, or what effect a change in the ban will have on it, but it may be all that protects against WPIs.
Tests: Single donor NAT
No effect on WPIs

WPI REDUCTION EFFECT
- HLQ/screening effect on WPIs unknown; at best less than 100% effective; at worst 0% effective
- We do not know how this works, or what effect a change in the ban will have on it, but it may be all that protects against WPIs

This is where the blood supply is protected from WPIs and emerging infections

Pathogen inactivation
By measuring the number of infections detected in presenting donors pre and post a change in the ban we can measure the effect of changing the ban, NOT OF THE BAN ITSELF, on the major driver of HIV WP risk – the demographic Incidence or prevalence? – either or both.

Other infections – Hep B, Syphilis? Maybe, maybe not.
Methods

Australia

UK

Canada

New Zealand

Incidence and prevalence of HIV in donors presenting at clinic and donating for an equal number of years before and after the ban.
Results

**Australia: 5 years before v 5 years after move from lifetime ban:**

HIV: 24/4,964,628 v 24/4,025,571

**UK: 2 years before v 2 years after move from lifetime ban**

Male infected donations: 375/4,000,000 donations v 295/4,000,000

**Canada: 2 years before and after move from lifetime ban**

HIV infected donors: (no change) per 100,000) x/y versus 6/1,800,000

**New Zealand: 3 years before move from 10 years to 5 years**

HIV infected donors: 3/301,563 v 1/284,120

HBV incidence in returning donors: 4/68,445 v 1/52,352
Conclusions

Analysis incomplete to date, but clear that there is no change in the demographic risk

For HIV

In changing from a lifetime (ten year) ban to a lesser ban

The margins of confidence around that statement are probably immense.

Although further data recategorisation and statistical work is required, the countries that have changed can be very confident they have not added to patient risk for HIV
Emerging infections

The debate here needs to be limited to:

New agents, causing new diseases

With very long incubation periods

During which time the infected person is entirely well

Like HIV, Hepatitis B, hepatitis C, vCJD

Not like malaria, SARS, MERS CoV
Emerging infections

What is the incubation period – of the disease

between significant spread, and recognition

Between recognition and identification

Between identification and test

Between test and implementation of effective blood safety measures

Between recognition and effective blood safety measures?
For vCJD

What is the incubation period – of the disease 10 years +
between significant spread, and recognition > 10 years
Between recognition and identification 0 years
Between identification and test > 20 years
Between test and implementation of effective blood safety measures
Between recognition and effective blood safety measures 3.5 years
For NSANIV

What is the incubation period – of the disease 3 years +

between significant spread, and recognition > 3 years

Between recognition and identification 0 years

Between identification and test 1 year

Between test and implementation of effective blood safety measures 1 year

Between recognition and effective blood safety measures months
<table>
<thead>
<tr>
<th>What we could do</th>
<th>What we would see</th>
<th>Emerging infection risk</th>
<th>HIV transmission risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do nothing</td>
<td>No sex in last 2 weeks (A) No new partner in 4 weeks No new partner in 3-12 months No MtoM sex 2 weeks No MtoM 3-12 months No MtoM sex 5 years No MtoM sex ever</td>
<td>This can be estimated from Spanish or Italian data;</td>
<td>In the past 40 years 4 major transfusion infections have emerged: Hepatitis B, Hepatitis C, HIV and vCJD. 1 was predominantly sexually transmitted, 2 partially so, and 1 entirely food borne. All had lag periods between emergence in the donor population and definitive action being put in place of greater than 5 years. In time new strains of HIV are very likely to emerge and may escape detection for a while, though the silent period and the time to effective action will likely be shorter than in the past – this scenario is used in this graphic.</td>
</tr>
</tbody>
</table>

**Factors affecting compliance:** culture, attitude, test seeking, peer pressure (marital, familial, work, peer group), malign intent, law (& enforceability) ....
Conclusions

1. It depends what the ban was brought in for

2. If for HIV as is, then changing it along the lines of Australia, UK, Canada, NZ is safe - no risk

3. If for generic emerging infections the debate is a different one, and the degree of uncertainty is different.

4. Managing uncertainty is possible, but it requires a very different debate than one around residual virus risks, compliance and test efficacy

5. That debate should be informed by a broader scientific community than we currently engage

6. My guess is that a 3 to 5 year ban would be safe, but a shorter one would need a degree of risk acceptance and structural risk defence management: single donor NAT capability, pathogen inactivation, leucodepletion, donation recipient exclusion
NEXT STEPS