

Viewpoint

Israel's ban on use of Ethiopians' blood: how many infectious donations were prevented?

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Many countries exclude blood donations thought to be associated with unacceptably high risks of HIV-1 or other infection. Blood donations from Ethiopian immigrants to Israel were taken and then discarded, without informing the donors, owing to the high prevalence of HIV-1 infection in this community relative to other Israelis.^{1,2} This policy became known via a newspaper exposé in January, 1996. One consequence was a violent protest by 10 000 Ethiopian immigrants that led to injuries to roughly 70 demonstrators and police officers;² a second was the establishment of a commission of inquiry chaired by former Israeli president Yitzhak Navon.³

The reason offered for the exclusion decision was that HIV-1 prevalence among Ethiopian immigrants was 50 times higher than the prevalence in the rest of the Israeli population. Of the 1500 or so HIV-1-positive people in Israel, 540 were Ethiopian immigrants. Since there were 60 000 Ethiopian immigrants out of a population of 5.5 million Israelis, the 0.9% prevalence of HIV-1 infection among Ethiopian immigrants was indeed about 50 times greater than the 1 in 5700 prevalence among other Israelis.³ In support of the ban, the *Jerusalem Post* wrote, "Had even one such donation caused the death of its recipient, the country would have been up in arms against the health authorities for being criminally lax."⁴

Critics focused on the failure to inform Ethiopian donors that their blood was being discarded, and the adverse social consequences for Israeli society in general and Ethiopian immigrants in particular. Israel's Minister of Health accused the central blood bank of behaviour that was "irregular, unethical and unfair . . . Ethiopian immigrants were laid down, a needle was pushed into their veins and a pint of blood was taken, but they were misled . . . This is a good example of how the path to hell may be paved by the best of intentions."⁵

Others noted that although Ethiopian immigrants were tested upon arrival in Israel, other Israelis were not systematically tested. Perhaps HIV-1 prevalence among non-Ethiopians was greatly underestimated (though this actually was not the case).⁶ Also, HIV-1 prevalence in the USA is roughly 25 times greater than that in Israel, yet public-health officials would not consider banning blood donations from US immigrants.

In reviewing the arguments for banning Ethiopian blood, two factors stand out. First, the HIV-1 risk assessments were argued in terms of HIV-1 prevalence, whereas the real risk was that the blood supply could become contaminated via infectious donations. Such donations occur when blood-screening tests yield false-

negative results. The false-negative rate depends largely on the window period between HIV-1-infection and the development of antibodies, and the incidence of HIV-1 infection.⁷⁻⁹ Second, the HIV-1-risk arguments were relative rather than absolute. The question is not whether the prevalence of infection among Ethiopian immigrants is 50 times greater than among other Israelis, but whether the incremental number of infectious donations prevented by exclusion of Ethiopian donors is sufficiently large to justify such a ban. This latter quantity depends on the number of discarded Ethiopian donations in addition to the per-donation risk of contamination. This paper estimates the number of infectious donations to Israel's blood supply originating from non-Ethiopian Israeli donors, as well as the number of infectious donations prevented by the ban on Ethiopian blood.

In Israel, all donated blood has been screened for HIV-1 antibody since 1986.¹⁰ The annual number of infectious donations emanating from a particular donor pool thus equals the product of the annual number of antibody-negative donations and the fraction of these donations that are actually infected (the false-reassurance rate). The false-reassurance rate is the product of the HIV-1-incidence rate among blood donors and the duration of the window period, currently estimated at 25 days (95% CI 9-41).^{7,8}

For both non-Ethiopian and Ethiopian Israelis, I assume that HIV-1 incidence among potential blood donors is equivalent to that in the population aged 15 years or greater, although the infection rate among potential donors is lower than in the general population owing to self-selection, and donors can also be excluded for reasons other than positive HIV-1 antibody.⁸ Assuming that all infections occur in the population aged 15 or above further inflates the presumed incidence rate among donors. Aggregate HIV-1 incidence among adult non-Ethiopian Israelis was estimated by backcalculation.⁶ From 1990 to 1993, an estimated 61 (SD 12) new infections occurred annually in this group. Of the 3.9 million non-Ethiopian Israelis aged 15 years or more,¹¹ an estimated 960 were infected.^{3,6} Division yields a presumed incidence of 1.6 per 100 000 uninfected people per year for non-Ethiopian Israeli blood donors. Multiplication by 25 days gives a false-reassurance rate of 1.1 per million antibody-negative donations. By comparison, in the USA, it has been estimated that 2.3 per million antibody-negative donations fall in the window.⁷

Virtually all HIV-1 infections among Ethiopian immigrants have occurred among adults who immigrated to Israel since 1991.^{3,12} The HIV-1 incidence rate among these immigrants aged 15 years or more has been estimated as 7 (SD 2) infections per 1000 uninfected people annually.¹³ However, recent immigrants comprise only 17 500 of the 42 000 Ethiopian Israelis aged 15 or

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more,¹⁴ which reduces the presumed HIV-1-incidence rate for the Ethiopian donor pool to 2.9 per 1000 uninfected people per year (after accounting for the 540 HIV-1-positive Ethiopian immigrants cited earlier).³ Multiplication by 25 days yields a false-reassurance rate of 2.0 per 10 000 antibody-negative donations.

Actual and attempted donation rates for non-Ethiopian and Ethiopian Israeli donors respectively are documented in the Navon Commission Report.³ Over the 5 years from mid-1990 through to mid-1995, there were 942 517 donors of whom 2055 were Ethiopian immigrants. This is an annual rate of 188 000 and 411 donors for non-Ethiopian and Ethiopian Israelis, respectively. However, in 1995 it was reported that there were 225 000 donations from 190 000 donors, or 1.18 donations per donor. I assume that this ratio applies to both groups of donors. Application of the multiplier to the reported number of donors suggests that 222 000 and 485 donations could be expected among non-Ethiopian and Ethiopian Israelis annually.

To obtain the annual number of antibody-negative donations requires multiplication of the above donation rates by the fraction of donors presumed antibody negative. Because there are an estimated 960 out of 3.9 million non-Ethiopian and 540 out of 42 000 Ethiopian Israelis who are HIV-1 antibody positive, there are 221 960 and 480 antibody-negative donations per year for non-Ethiopian and Ethiopian donors. Only 0.2% of all antibody-negative donations would come from Ethiopian Israelis.

Of 221 960 annual antibody-negative donations from non-Ethiopian Israelis, 1.1 in 1 million are estimated to be infected, an annual rate of 0.24 (roughly one infectious donation every 4 years). Of 480 annual antibody-negative donations from Ethiopian Israelis, an estimated 2.0 per 10 000 would have been infectious, an annual rate of 0.1 (one infectious donation every 10 years). Consequently, the banning of Ethiopian donors reduced the annual number of HIV-1 infected donations from 0.34 to 0.24, an absolute reduction of only 0.1 infectious donations per year.

The analysis suggests that Israeli blood bankers vastly overestimated the risk posed by Ethiopian donors. Those favouring exclusion have asked if one would knowingly accept a transfusion from an Ethiopian. This misses the point. What is required is a willingness to accept blood from a supply of antibody-negative donations, 0.2% of which come from Ethiopian immigrants.

Whether it was reasonable to ban Ethiopian donors rests with the costs of the exclusion policy relative to the meagre benefits provided by the ban. Viewed simply from this perspective, was banning Ethiopian donors justified? The costs of treating those injured in protests might exceed the cost resulting from an additional infectious donation every 10 years. The stigma placed on the

Ethiopian community in Israel on account of this policy was substantial. It also threatened the adequacy of the blood supply because, after the disclosure of the exclusion policy, there was a significant drop in donations.¹⁵

The Navon Commission recommended that Israel change its policy: donors should be excluded if, during the 10 years before donation, they spent at least 6 months in any of 63 listed countries with high AIDS rates relative to Israel; if they visited one of these countries in the year preceding donation; or if they report known HIV-1 risk (such as haemophilia) or risk behaviours.³ Navon himself noted that the main effect of this new policy would be the continued exclusion of Ethiopian Israeli donors. The Ministry of Health had not officially adopted this policy as of April, 1997, proposing instead to let blood-bank physicians decide whether to accept blood from Ethiopian Israeli donors on a case-by-case basis.

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