# HIV non-disclosure and Canadian criminal law:

## Antiretroviral treatment and viral load

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## The Context

- *In Canada, people living with HIV can be criminally prosecuted and convicted for not disclosing their status before engaging in an activity that represents a "significant risk" of HIV transmission.*
- *Unprotected sex is usually considered an activity that requires HIV disclosure under Canadian criminal law. However, when a person has a low or an undetectable viral load, including as the result of effective treatment with antiretroviral drugs (ARVs), the risks of HIV transmission through sex are very much reduced. As a result, even if vaginal or anal sex is unprotected, the risk should no longer be considered "significant" for purposes of the criminal law.*
- *Using the criminal law in circumstances where the risk of transmission is almost zero or very low amounts to punishing people for being HIV-positive rather than for exposing an uninformed partner to HIV infection. Such broad use of the criminal law could amount to discrimination against people living with HIV and undermine HIV prevention and treatment efforts.*
- *The legal significance of a person's viral load, and whether and when disclosure of HIV-positive status is still required upon pain of criminal prosecution, needs to be clarified to ensure a limited and fair use of the criminal law in cases of HIV exposure and transmission. In the absence of additional factors establishing beyond a reasonable doubt that the risk of HIV transmission is significant, Canadian law should not permit a person living with HIV to be prosecuted and convicted when he or she had a low or undetectable viral load at the time he or she had sex. In cases where a person has been on ARV treatment, there should be a rebuttable presumption that the risk of transmission is not "significant." The prosecution should be required to prove the existence of a significant risk notwithstanding treatment.*

**This document will inform you about:**

1. when there is a legal duty to disclose HIV-positive status;
2. the current evidence regarding the impact of ARV treatment and viral load on the risk of HIV transmission;
3. the current state of the law regarding viral load and HIV disclosure; and
4. why people should not be prosecuted or convicted for HIV non-disclosure when they have a low or undetectable viral load.

## When is there a duty to disclose HIV-positive status?

In 1998, the Supreme Court of Canada decided that, when there is a **"significant risk of serious bodily harm"** (i.e., of HIV transmission), then not disclosing one's (known) HIV-positive status to a sexual partner can amount to "fraud" and therefore invalidates a partner's consent to sex.[1] Because having sex with someone who has not given legally valid consent is a (sexual) assault in law, the Court ruled that a person living with HIV who does not disclose his or her status in circumstances where there is a significant risk of transmitting HIV can be convicted on assault charges even when no transmission occurs.

It was clear from the decision that the Court was *not* imposing a general duty on people living with HIV to disclose their status in every sexual encounter. However, the Court did not clearly define which activities pose a "significant risk" of transmission.

The specific circumstances in the case before the Court involved an HIV-positive man accused of having unprotected vaginal sex several times with each of two HIV-negative women — none of whom became infected. The Supreme Court ruled that, in such circumstances, the fact that he did not disclose his HIV status could amount to fraud vitiating his partners' consent.

However, since that decision, the science related to HIV and its treatment has evolved. Studies have shown a strong correlation between a person's **viral load** (i.e., level of HIV, usually measured through blood testing) and the risk of transmission. Antiretroviral (ARV) treatment has been shown to reduce viral load and hence HIV transmission. The sexual encounters that gave rise to the assault charges in the case before the Supreme Court occurred in the early 1990s; at that time, highly active ARV therapy was not fully available in Canada and little was known with certainty about the impact of treatment on risks of HIV transmission. Therefore, the impact of an accused person's viral load on criminal liability for not disclosing HIV-positive status was not addressed by the Supreme Court. How these new developments in the science of HIV are relevant to the application of the legal test of a "significant risk" of transmission has become a crucial issue in cases of alleged HIV non-disclosure.

## The impact of viral load and ARV treatment on the risk of HIV transmission[2]

Viral load is the term used to describe the amount of HIV circulating in the body, and is usually measured in the blood. Proper HIV care includes routine viral-load testing every three to six months in order to inform treatment decisions. Viral load is measured in the number of copies of HIV per millilitre of the fluid tested.

The tests currently used in Canada can measure blood plasma viral loads as low as 20 to 50 copies/ml. Below this level, viral load is said to be "undetectable." This does not mean that HIV has been eliminated from the body, but rather that it is below the level of detection of the test. The definition of an "undetectable" viral load will vary slightly from one country to another, depending on the level of detection of the tests being used. The goal of antiretroviral therapy is to render viral load undetectable.[3]

It is now generally accepted that effective antiretroviral therapy, which reduces viral load, dramatically reduces the risk of sexual HIV transmission.

In 2008, the Swiss Federal Commission on HIV/AIDS issued a medical assessment stating that people under antiretroviral therapy who have an undetectable viral load could be, under certain conditions, considered as non-infectious:

> An HIV-positive individual not suffering from any other STD [sexually transmitted disease] and adhering to antiretroviral therapy (ART) with a completely suppressed viremia [defined by the Commission as a viral load below 40 copies/ml] does not transmit HIV sexually, i.e., he/she cannot pass on the virus through sexual contact. This statement is valid provided that:
>
> – The HIV-positive individual fully complies with the antiretroviral therapy and is monitored by an attending physician;
> – The viral load (VL) has been non-detectable for at least six months (i.e., viremia has been suppressed for at least six months);
> – The HIV-positive individual does not have any other sexually transmitted disease (STD).[4]

This statement created controversy in 2008 on the grounds of remaining uncertainty as to just how much effective ARV treatment, reducing a person's viral load to undetectable levels, reduces the risk of sexual transmission of HIV during unprotected sex. While the risk is dramatically reduced when viral load is undetectable, it has not been proven to be completely eliminated.[5] However, it is generally accepted that people under antiretroviral therapy are less infectious, and international organizations such as UNAIDS and the World Health Organization (WHO) now promote ARV treatment as a means of preventing the spread of HIV at the population level.[6]

Subsequent scientific studies on the relationship between ARV treatment, blood viral load and sexual transmission have since further confirmed that effective treatment and low viral load has a substantial impact on the risk of HIV transmission.

According to a 2009 systematic review and meta-analysis of available studies, no transmission of HIV was observed from people treated with ARV therapy and with a viral load below 400 copies/ml (i.e., a low, but still detectable, viral load according to tests currently used in Canada).[7]

Overall, the analysis found that ARV treatment (without considering viral load independently) reduced transmission among male/female couples by 92 percent.[8] It also found that, when viral load is lower than 400 copies/ml, the risk of HIV transmission could be as high as 0.013 percent per act of sexual intercourse among male/female couples (or about 1.3 conversions among 10 000 acts). These data include both people on ARV treatment and people who had a naturally low viral load.[9]

Three cohort studies involving a total of 762 male/female couples later found no cases of transmission from people on ARV treatment. Two of these studies found the HIV-positive partner's viral load undetectable in the majority of participants.[10] Another study of nearly 3400 male/female couples observed a 92 percent reduction in new HIV infections in couples in which the known HIV-positive partner started ARV treatment.[11]

Finally, a recent international study funded by the United States National Institutes of Health and involving 1763 couples (the vast majority of whom were male/female couples) in Botswana, Brazil, India, Kenya, Malawi, South Africa, Thailand, the United States and Zimbabwe found that an earlier initiation of ARVs led to a 96 percent reduction in HIV transmission.[12] The clinical trial was slated to end in 2015 but the results were released earlier as it was clear that use of antiretroviral drugs by HIV-positive individuals with relatively healthier immune systems substantially reduced transmission to their partners.[13] The studies on the impact of ARV treatment and viral load on the risk of HIV transmission have largely concerned male/female couples. Therefore, quantifying the impact on the risk of transmission among men who have sex with men is more uncertain. However, the basic principle that, in a given encounter, the reduced viral load of an HIV-positive partner will translate into a reduced risk of transmission remains applicable.

## Per-act risk of HIV transmission: the impact of viral load under 400 copies/ml

| | Vaginal sex (HIV+ man) | Vaginal sex (HIV+ woman) |
|---|---|---|
| Estimated risk of HIV transmission **without consideration of individual's viral load** | 1 in 1250 sexual encounters (0.08 percent)[14] | 1 in 2500 sexual encounters (0.04 percent)[15] |
| Estimated risk of HIV transmission **when individual's viral load is below 400 copies/ml** | 1.3 in 10 000 sexual encounters (0.013 percent)[16] | |

Source: S. Attia, et al., "Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis," *AIDS* 23 (2009): pp. 1397–1404, described in E. Mykhalovskiy, G. Betteridge, and D. McLay, *HIV Non-Disclosure and the Criminal Law: Establishing Policy Options for Ontario*, August 2010, funded by the Ontario HIV Treatment Network.

## The current state of the law about viral load and HIV disclosure

In the years since the Supreme Court of Canada decided the *Cuerrier* case in 1998, about 130 PHAs in Canada have been criminally charged in relation to alleged non-disclosure of their HIV-positive status to their sexual partners. However, only a few cases have yielded

any specific interpretation by the courts of the legal impact of viral load and ARV treatment on how to apply the "significant risk" test. Three recent decisions at the appellate level have created important binding precedents in their respective provinces and provide some guidance across Canada. All three decisions confirmed that viral load is an important, and potentially decisive, factor of the risks of transmission in HIV non-disclosure cases.

### *Viral load: a relevant factor in the assessment of the risks of transmission*

One of the first court decisions in Canada to deal with the question of viral load and its impact on the assessment of the risk of transmission is a decision by the Court of Appeal of British Columbia in 2009.[17] In this case, the Court ruled that "if viral load of the accused at the time of the sexual relations is known or can be estimated, then it will be *very relevant* to determining whether there was a significant risk of serious bodily harm,"[18] and thus affect possible criminal liability.

Subsequently, in October and December 2010, two persons living with HIV were acquitted by the Court of Appeal of Manitoba[19] and the Court of Appeal of Quebec[20] on the grounds that they had an undetectable viral load at the time they had sex, and that the risks of HIV transmission through unprotected sex could thus not be considered as "significant" in the sense of the criminal law.[21]

### *Legal significance of viral load requires a case-by-case analysis*

The Court of Appeal of Manitoba is the first court in Canada to acquit a person living with HIV who did not disclose his status before having unprotected sex because he had an undetectable viral load and therefore was under no legal obligation to disclose.[22]

At trial, the judge had ruled that even when viral load is undetectable, there is a significant risk of HIV transmission for the purpose of the criminal law. The risk would only be sufficiently reduced when a person has *both* an undetectable viral load *and* uses a condom. The Court of Appeal disagreed with this interpretation of the "significant risk" test set out in *Cuerrier*,[23] pointing out that this assertion was not compatible with the medical evidence available before the Court. The Court further insisted that "[l]egal assessments of risk in this area should be consistent with the available medical studies."[24]

However, the Court declined to make a general statement that an undetectable viral load would automatically preclude criminal liability. Instead, the Court said that whether or not the accused person had a duty to disclose his or her HIV-positive status would depend on the facts and the medical evidence available in each case.[25] For instance, the Crown could perhaps show that additional factors increased the risk of transmission in a particular case (e.g., the accused had another sexually transmitted infection at the time of the sexual encounter, which might have led to an increase in the viral load[26]), or the Crown might otherwise put forward medical evidence showing that there was a "significant risk" of transmission.

The Court of Appeal of Quebec followed the same approach as the Court of Appeal of Manitoba and clearly indicated that whether an accused's low viral load would sufficiently reduce the risk of HIV transmission so that it is no longer "significant" would depend on the facts and the medical and scientific evidence in each case.[27]

The issue of viral load is relatively new and reflects the complexity of the science related to HIV. While courts have been ready to consider that an undetectable viral load can preclude criminal liability, they have not been ready to make any general statement on the impact of viral load and treatment on the duty to disclose. They chose to leave the door open for the introduction of any possible evidence, including new scientific evidence that would show that the risk of transmission may still be "significant" despite a low viral load[28] — despite the fact that recent scientific developments have reinforced the finding that a low viral load substantially reduces the risks of transmission.

Despite remaining uncertainties regarding the impact of viral load on criminal liability, these provincial appellate court decisions set important precedents. In both cases, the Crown has applied for leave to appeal to the Supreme Court of Canada. This can be an opportunity for the highest court to clarify the law by providing clear guidance on the role of viral load and treatment in prosecutions for HIV non-disclosure.

## Low viral load should preclude prosecution for HIV non-disclosure

### *Criminalizing people when the risk of HIV transmission is very low is not compatible with the current law in Canada*

The law in Canada obliges a person living with HIV to disclose his or her status before engaging in an activity that represents a "significant risk" of HIV transmission. Numerous peer-reviewed scientific studies have established average risk levels for HIV transmission associated with different sexual activities which show that HIV is not easy to transmit.[29] Even activities considered as "risky" carry a relatively low risk of transmission.[30] As a result, most instances of unprotected vaginal or anal intercourse between an HIV-positive person and his or her partner do not result in transmission. The chance of transmission is further reduced when a person has a low viral load — and as a general matter, being on ARV treatment (the purpose of which is to reduce viral load) is associated with a dramatic reduction in risk of transmission.[31] As mentioned earlier, it has been found that antiretroviral therapy reduces heterosexual transmission by 92 percent. This means that the risk might be even lower than where sex is protected by a condom, which has been estimated to reduce the risk of HIV transmission by 80 percent.[32]

In *R. v. Mabior*, the Crown's scientific expert testified that "[i]t is extremely unusual to transmit with a viral load of less than 1500 copies." He further stated that "the risk of HIV transmission is … very low if [viral load] is undetectable." His conclusion was that "there was a very high probability that the accused was not infectious and could not have transmitted HIV throughout" the period when his viral load was undetectable.[33]

In *R.* c. *DC*, the evidence was similar. According to the Crown's scientific expert, the risk of transmission, when the viral load is undetectable, is "very low, very minimal … almost zero" [translation from French original]. The risk can decrease to "1 in 10 000."[34]

As acknowledged by appellate courts in British Columbia, Manitoba and Quebec, courts cannot ignore the reality of HIV and the evolutions in science since the Supreme Court of Canada's decision in *Cuerrier* in 1998. Just as the Supreme Court suggested that condom use may reduce the risk of transmission so that it is no longer legally "significant," so too must courts consider the legal implications of the dramatic reduction of transmission risk where a person has a low or undetectable viral load, as well as the implications of ARV treatment showing reduced transmission. Recall that the majority judgment in *Cuerrier* made it clear that "it cannot be any trivial harm or risk of harm that will satisfy this requirement [i.e., deprivation] where the activity would have been consensual if the consent had not been obtained by fraud."[35]

One difficult issue with viral load is that it is a snapshot of the amount of the virus in the blood at the time the viral load is being tested. Some may argue that, as a result, it cannot be proved beyond a reasonable doubt that a person had a low or an undetectable viral load at the very time of the sexual relationship. However, given the well-known impact of ARV treatment on the risks of HIV transmission, the risk is unlikely to be significant if a person living with HIV is proved to be on treatment at the relevant time. The same is true for people whose viral load when tested some months before or after the relevant sexual relation was low or undetectable. In such circumstances, it is up to the Crown, which has to prove its case beyond a reasonable doubt, to provide some specific evidence to establish that, in a particular case, the risks of transmission were significant due to the presence of other factors which increased the risk of transmission.[36]

Another difficulty relates to the fact that the most marginalized persons living with HIV are often those who have little or no access to treatment and care, including ARV treatment that lowers viral load. This illustrates how the criminalization of HIV non-disclosure becomes another way in which those without access to care can bear, or be exposed to, a greater risk of an additional burden.

### *Criminalizing people when the risk of transmission is very low is unfair*

In the absence of additional factors that would significantly increase the risks of HIV transmission, people living with HIV who have a low viral load — which can presumptively include those on ARV treatment — do not pose a significant risk of HIV transmission to their sexual partners. Therefore, they should not be prosecuted for having sex, even if they do not disclose their status. Criminalizing people in circumstances where there is almost zero or very low risk of transmission amounts to punishing people for being HIV-positive rather than for exposing a partner to a significant risk of infection without disclosure. That is not only wrong under current Canadian law but it would also amount to discrimination against PHAs contrary to the *Canadian Charter of Rights and Freedoms*.[37]

### *Criminalizing people when the risk of transmission is very low fuels ignorance and stigma, undermines public health*

Concerned about the negative impact of the criminalization of HIV non-disclosure on people living with HIV and on public health, UNAIDS has urged governments to reject the use of the criminal law when there is no significant risk of HIV transmission.[38]

Treatment and care are essential to the life and well-being of people living with HIV. With advances in therapy, the life of PHAs has been significantly improved. While HIV infection remains a serious condition, it can become a manageable one and people with access to ARV treatment and other care can expect a lifespan approximating the average. Access to treatment and care also provides people with the support they need to deal with stress, depression or anxiety that may be associated with living with HIV. Any barrier to accessing treatment and care has an impact on individual health and well-being.

Access to treatment and care has also been proven essential to HIV prevention. Evidence suggests that one factor strongly associated with changes in behaviour, including practising safer sex, is having received good-quality voluntary counselling and testing.[39] At the same time, scientific studies (including in Canada) show that the period of early infection, when people are unlikely to be aware of their status and seek treatment and care, accounts for approximately half of onward transmissions.[40] Encouraging people to get tested and seek care is therefore crucial to prevent new infections.

In addition to the impact of treatment and care on behaviour changes, it is now well-established that effective treatment reduces the risk of HIV transmission and can be used as a tool for preventing HIV transmission at the population level.[41] Based on these findings, UNAIDS has developed an approach aiming to drastically scale up testing and treatment worldwide. It estimates that successful implementation of this programme could avert 10 million deaths, and 1 million new HIV infections, by 2025.[42] In British Columbia, the government has recently launched a program called "seek and treat" which aims at improving access to treatment and care among hard-to-reach communities.[43] One of the goals of this program is also to prevent new HIV infections using treatment as prevention.

While there is no evidence that applying criminal law to HIV risk behaviour reduces the spread of HIV by *incapacitating* or *rehabilitating* particular offenders or by having a *deterrent* impact, there are great concerns that it is undermining public health and HIV prevention efforts by creating additional barriers to HIV testing, treatment and care.

One way in which the criminalization of HIV non-disclosure can create additional barriers — and in fact result in *less* disclosure, rather than *more* — is by threatening the therapeutic relationship between a patient and his/her physician or between a client and his/her health service providers.[44] PHAs may be inhibited from talking openly about their risk behaviors, sexually transmitted diseases, or the challenges they may be facing around disclosure if they fear that this information could later be used against them in a legal proceeding.[45] Some may not agree to partner notification procedures if they worry that a partner might in turn have them charged for non-disclosure. Some may avoid HIV testing, counselling,

education or support services for fear of prosecution should their HIV-positive status become known.[46] Some vulnerable populations, including women, already face specific challenges in accessing services, including HIV testing, and there are concerns that the efforts made to address these challenges may also be undermined by the criminalization of HIV transmission and/or exposure.[47]

Finally, a broad use of the criminal law against PHAs inevitably reinforces stigma associated with HIV. Part of what fuels stigma is an exaggerated sense of HIV risk and hence the perceived threat posed by HIV-positive people. Criminal prosecutions that convey misinformation to the public, by targeting activities that do not carry a significant risk of transmission (including when a person is under treatment and/or has a low or undetectable viral load) feed that exaggerated sense of risk. This in turn contributes to further discrimination against people living with HIV. Stigma also has adverse effects on the effective diagnosis and treatment of HIV disease and on the further spread of HIV among the population, including impeding HIV disclosure and the adoption of protective measures.[48]

Disclosure of HIV status before sex may sometimes be ethically required but that does not mean people should be automatically criminals and imprisoned when they do not disclose. This is particularly true when the risks of HIV transmission are not significant. As pointed out by Justice Fenlon "not every immoral or reprehensible act engages the heavy hand of the criminal law. Aggravated sexual assault is a most serious offence — a person convicted of this charge is liable of imprisonment for life, the harshest penalty provided for in the law. Only behaviour that puts a complainant at a significant risk of serious bodily harm will suffice to turn what would otherwise be a consensual activity into an aggravated sexual assault."[49]



## References

[1] *R. v. Cuerrier* [1998] 2 SCR 371, para. 128.
[2] Section 3 of E. Mykhalovskiy, G. Betteridge, and D. McLay, *HIV Non-Disclosure and the Criminal Law: Establishing Policy Options for Ontario,* August 2010, funded by the Ontario HIV Treatment Network, p. 32.
[3] NAM/aidsmap, "Viral Load" at http://aidsmap.com/page/1044622/; Catie, *Viral load testing*, produced in partnership with the Canadian Association of HIV Clinical Laboratory Specialists (CAHCLS), 2006.
[4] P. Vernazza, et al., "Les personnes séropositives ne souffrant d'aucune autre MST et suivant un traitement antirétroviral efficace ne transmettent pas le VIH par voie sexuelle," *Bulletin des médecins suisses* 89, 5 (2008): pp.165–169.

[5] NAM/aidsmap, "Viral Load," *supra*; S. Attia, et al., "Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis," *AIDS*, 23 (2009): pp. 1397–1404.
[6] UNAIDS, *Treatment 2.0,* fact sheet, July 2010, available at data.unaids.org.
[7] S. Attia, et al., "Sexual transmission of HIV," *supra*. In this particular review, an undetectable viral load is defined as fewer than 400 copies/ml based on the detection limit of tests used in most of the eligible studies being reviewed.
[8] Ibid. Note that the review included only male/female couples and there were insufficient data to calculate rates of transmission according to the presence or absence of sexually transmitted infections, condom use, or vaginal or anal intercourse among the couples.
[9] Ibid.; E. Mykhalovskiy, G. Betteridge, and D. McLay, *HIV Non-Disclosure and the Criminal Law*, *supra*, section 3, p. 33.
[10] J. Del Romero, et al., "Combined antiretroviral treatment and heterosexual transmission of HIV-1: cross sectional and prospective cohort study," *British Medical Journal,* 340(2010) c.2205. Among 144 couples, the partner known to have HIV was taking combination ARV treatment. These couples accounted for over 7000 unprotected acts of intercourse but no HIV seroconversion was observed among the HIV-negative partners; M.G. Melo, et al., "Sexual transmission of HIV-1 among serodiscordant couples in Porto Alegre, southern Brazil," *Sexualyl Transmitted Diseases*, 35(11) (2008): pp. 912–915. In this study, 93 heterosexual couples in Brazil were followed over six years. The study found that there was no transmission in the 41 couples where the HIV-positive partner was on ARV therapy with an undetectable viral load, compared with six transmissions in the couples where the HIV-positive partner was not under treatment; S. Reynolds, et al., "ART reduced the rate of sexual transmission of HIV among HIV discordant couples in rural Rakai, Uganda," 16th Conference on Retroviruses and Opportunistic Infection (2009), abstract 52a. In this study, 205 heterosexual couples were followed for a median of 1.5 years. Even though 15 of the 20 HIV-positive partners on treatment achieved a viral load below 400 copies/ml after six months of treatment, no transmissions were observed in any of the 20 couples over 1.1 years of follow-up, compared to 34 transmissions where the HIV-positive partner was not on treatment. See also, S. Reynolds, "HIV-1 transmission among HIV-1 discordant couples before and after the introduction of antiretroviral therapy in Rakai, Uganda," *AIDS,* 25(4)(2011), pp. 473–477, which shows that HIV-1 transmission may be reduced among HIV-1 discordant couples after initiation of ART, due to reductions in HIV-1 viral load and increased consistent condom use.
[11] D. Donnell, et al., "Heterosexual HIV-1 transmission after initiation of antiretroviral therapy: a prospective cohort analysis," *The Lancet* 375 (2010): pp. 2092–2098. One of the limitations of some of the mentioned studies is that their results may not exclude the influence of other factors known to have an impact on HIV transmission, including condom use.
[12] M.H. Cohen, et al., "Prevention of HIV-1 Infection with Early Antiretroviral Therapy," *The New England Journal of Medicine* 365(2011): pp. 493–505.
[13] United States National Institutes of Health, "Treating HIV-infected people with antiretrovirals significantly reduces transmission to partners: Findings result from NIH-funded international study," News release, May 12, 2011.
[14] M. C. Boily, et al., "Heterosexual risk of HIV-1 infection per sexual act: systematic review and meta-analysis of observational studies," *The Lancet Infectious Diseases* 9, 2 (2009): pp. 118–129. This estimate results from studies in high-income countries.
[15] Ibid.
[16] The 0.013 percent per-act estimate comes from the authors' statement in the discussion, p. 1402: "We found that there is considerable uncertainty about this risk: first, although there were no observed episodes of HIV transmission from people with undetectable viral load on highly active antiretroviral therapy, data are compatible with one new HIV infection for every 79 person-years of follow-up (one per 7900 sex acts if the yearly average is 100 contacts and transmission probability is constant)." One transmission per 7900 sex acts gives a per-act risk of 1/7900 or 0.013%.
[17] *R. v. Wright*, 2009 BCCA 514.
[18] Ibid., para. 32 [emphasis added].
[19] *R. v. Mabior (C.L.)*, 2010 MBCA 93.
[20] *R.* c. *D.C.*, 2010 QCCA 2289.
[21] The Court of Appeal of Manitoba and Quebec were not bound by the decision of the Court of Appeal of British Columbia but chose nevertheless to follow the same approach.

[22] *R. v. Mabior (C.L.)*, 2010 MBCA 93.
[23] Ibid., see para. 67–68.
[24] Ibid., para. 58.
[25] Ibid., para. 113.
[26] Ibid., para. 152.
[27] *R.* c. *D.C.*, 2010 QCCA 2289, paras. 112–114.
[28] *R. v. Mabior*, 2010 MBCA 93, para. 113.
[29] See, for example, M. C. Boily, et al., "Heterosexual risk of HIV-1 infection per sexual act, *supra*.
[30] E. Mykhalovskiy, G. Betteridge, and D. McLay, *HIV Non-Disclosure and the Criminal Law*, *supra*, Section 3, p. 26.
[31] See, S. Attia, et al., "Sexual transmission of HIV," *supra*, note 5.
[32] According to a recent review of available scientific studies of serodiscordant heterosexual couples, the consistent use of condoms results in 80 percent reduction in HIV incidence. See, S. C. Weller and K. Davis-Beaty, "Condom effectiveness in reducing heterosexual HIV transmission (Review)," *Cochrane Database of Systematic Reviews* 1 (2002) No.: CD003255. DOI: 10.1002/14651858.CD003255. For more information, please see the brief, Canadian HIV/AIDS Legal Network, *HIV non-disclosure and the criminal law,* 2011.
[33] *R. v. Mabior (C.L.)*, 2010 MBCA 93 para. 106.
[34] *R. c. D.C.*, 2010 QCCA 2289. Evidence of Dr. Klein.
[35] *Cuerrier,* para 128.
[36] *R. v. Mabior*, paras. 100, 152.
[37] Section 15.
[38] UNAIDS, *Policy brief: criminalization of HIV transmission*, August 2008.
[39] WHO, *Technical consultation in collaboration with the European AIDS treatment group and AIDS Action Europe on criminalization of HIV and other sexually transmitted infections*, October 16, 2006, citing UNAIDS, *The Impact of Voluntary Counselling and Testing: A global review of the benefits and challenges* (Geneva: UNAIDS, 2001) and studies cited therein; L.S. Weinhardt, et al., "Effects of counselling and testing on sexual risk behavior: A meta-analytic review of published research, 1985–1997," *Am J Public Health* 89 (1999): pp. 1297–1405.
[40] B.G. Brenner, et al., "High rates of forward transmission events after acute/early HIV-1 infection," *The Journal of Infectious Disease* 195 (2007): pp. 951–959. M. Wawer, et al., "Rates of HIV-1 Transmission per Coital Act, by stage of HIV -1, Infection in Rakai, Uganda," *Journal of Infectious Diseases*, 191 (2005), pp. 1403–1409.
[41] J. Montaner, et al., "Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: a population-based study," *The Lancet*, 376 (2010): pp. 532–539. This study has confirmed the preventive benefits of antiretroviral treatments. While the number of people actively receiving highly active antiretroviral therapy in the province increased by 547 percent between 1996 and 2009, the number of HIV cases decreased by 52 percent over the same period.
[42] "Global: A radical new UNAIDS Treatment strategy," IRIN PlusNews, Johannesburg, 16 July 2010; D. Black, "New hope to halt spread of HIV, *Toronto Star*, 19 July 2010.
[43] C. Kazatchkine, "British Columbia project seeks to improve access to HIV treatment and care among hard-to-reach communities", *HIV/AIDS Policy and Law Review,* 14 (3), June 2010.
[44] E. Mykhalovskiy, "The problem of 'significant risk': Exploring the public health impact of criminalizing HIV non-disclosure," *Social Science and Medicine* 73(5): pp. 668–675.
[45] Prosecutors regularly seek evidence from medical or other records in prosecuting clients accused of exposing others to risk of HIV infection without disclosing. Canadian law does not automatically protect counselling or medical records from being seized by police or introduced as evidence in court. A search warrant to seize those records can be issued or a counsellor or a physician could be compelled by subpoena to testify about discussions he/she had with a client. See also, Ibid, and A. MacDonald and H. Worth, "The Mad and the Bad: HIV Infection, Mental Illness, Intellectual Disability and the Law," *Sexuality Research and Social Policy: Journal of NSRC* 2(2) (2005): pp. 51–62; E. Mykhalovskiy, G. Betteridge, and D. McLay, *HIV Non-Disclosure and the Criminal Law*, Section 4; E. Cameron, "Criminalization of HIV transmission: poor public health policy," *HIV/AIDS Policy and Law Review* 14(2) (2009); UNAIDS, *Policy brief: criminalization of HIV transmission*, August 2008
[46] P. O'Byrne, "Criminal Law and Public Health Practice: Are the Canadian HIV Disclosure Laws an Effective HIV Prevention Strategy?," *Sex Res Soc Policy*, 2011 (in press); E. Cameron, *supra*; UNAIDS,

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