



BC Centre for Disease Control
An agency of the Provincial Health Services Authority

655 West 12th Avenue
Vancouver, BC V5Z 4R4

Tel 604.707.2400
Fax 604.707.2401

www.bccdc.ca

Impact of STOP HIV/AIDS Program on HIV, Hepatitis C and Syphilis Testing Volumes in British Columbia

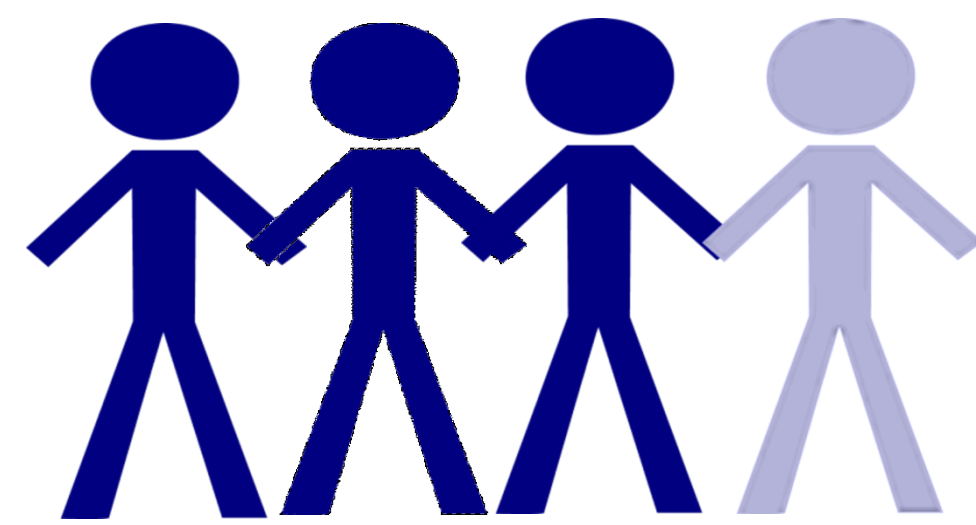
T. B. Consolacion¹, A. Yu¹, N. Z. Janjua^{1,2}, J. Wong¹, R. Barrios^{2,3}, J. S. G. Montaner^{2,3}
M. Morshed^{2,4} & M. Krajden^{1,2,4}

¹BC Centre for Disease Control, ²University of British Columbia, ³BC Centre for Excellence, ⁴Provincial Health Microbiology & Reference Laboratory

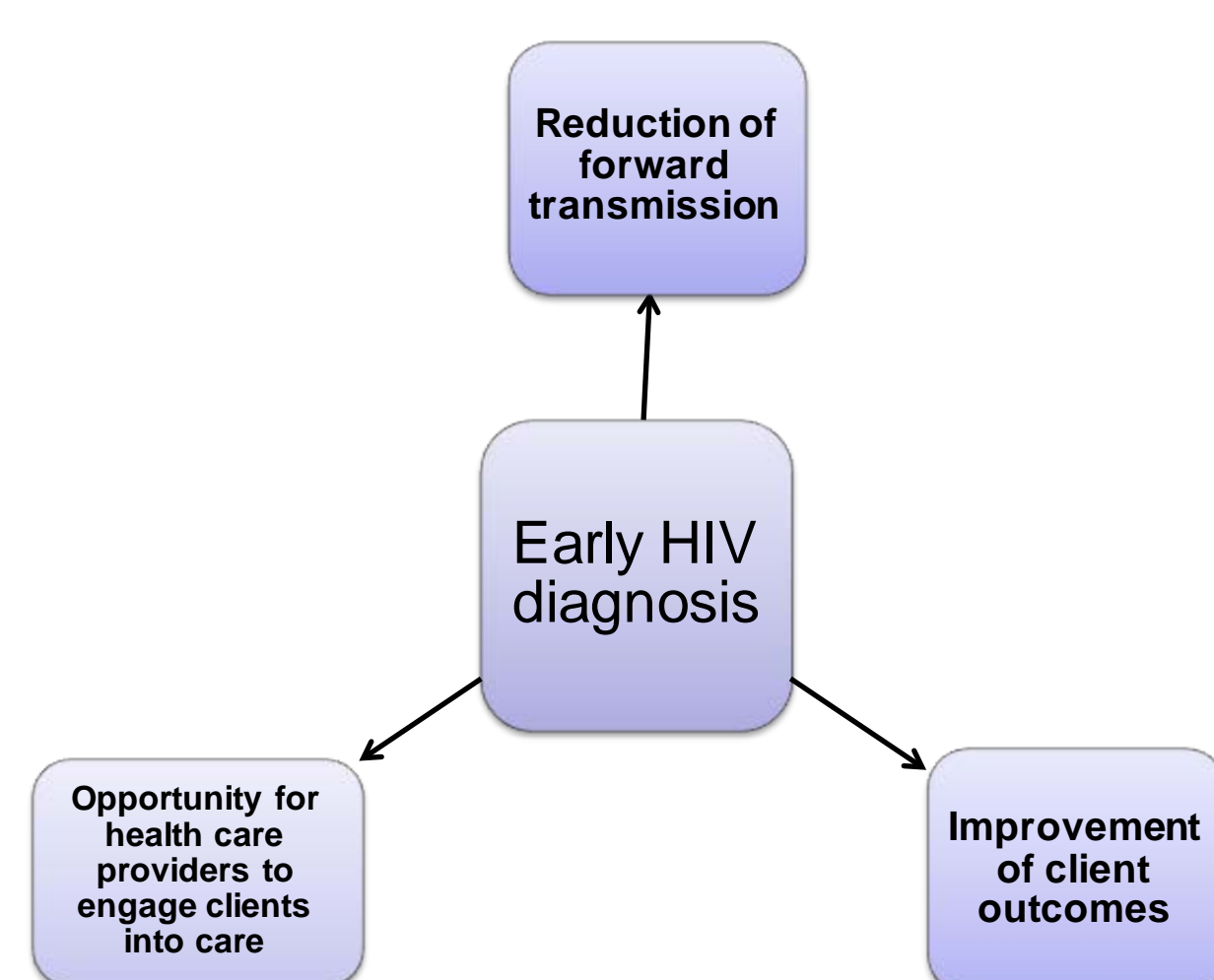


Background

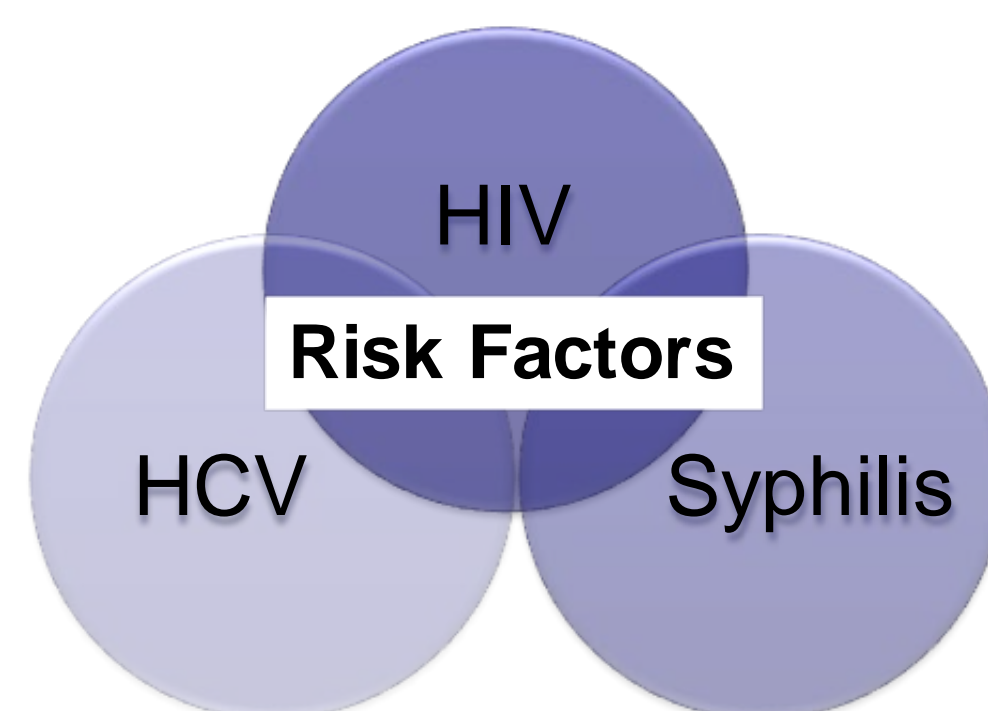
1 in 4 people in Canada living with HIV are unaware of their status¹



Benefits of early diagnosis of individuals living with HIV who are unaware of their HIV status include²:

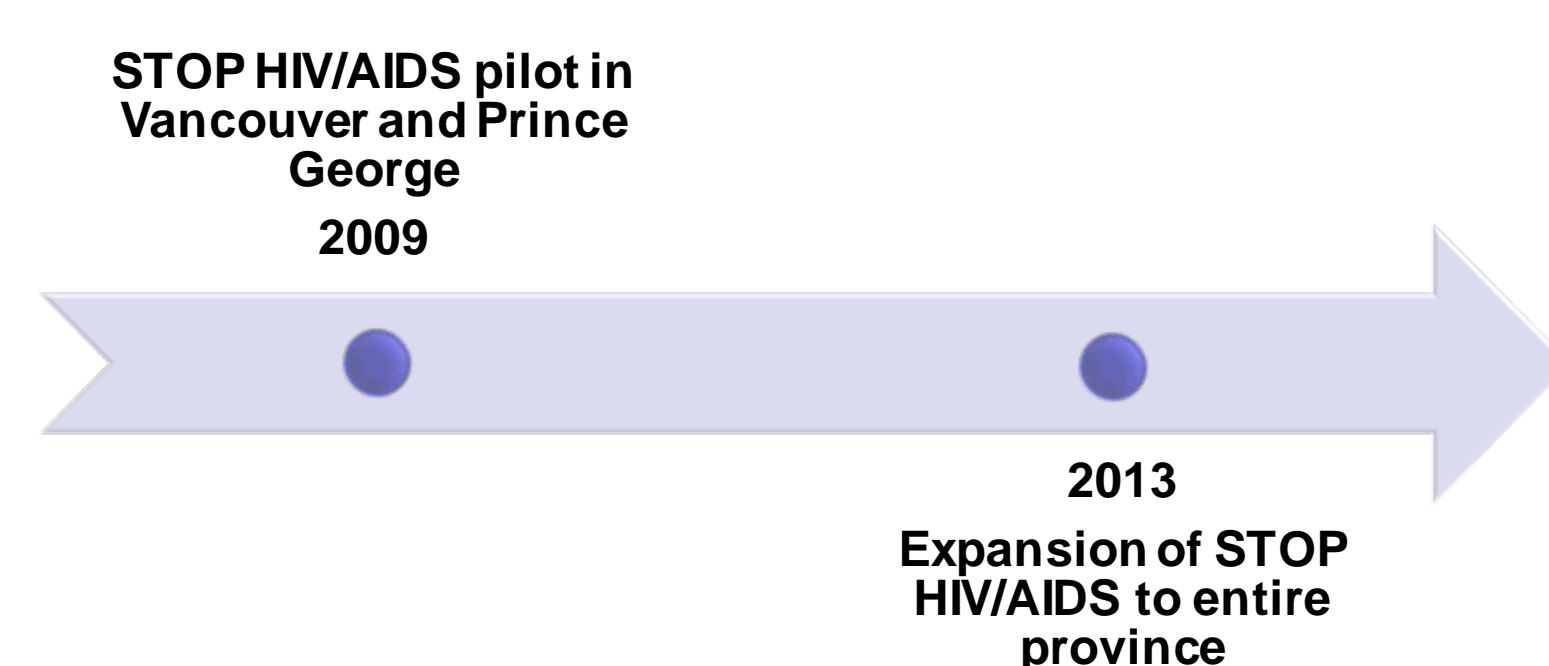


Because of shared risk factors, HIV testing was expected to affect hepatitis C (HCV) and syphilis testing as well.



The STOP HIV/AIDS program was launched to reduce the impact of HIV/AIDS by encouraging routine testing for HIV and improving access to treatment to prevent onward transmission.

Timeline of STOP HIV/AIDS



Purpose

We examine the trend in HIV, HCV and syphilis testing from 2006 (pre-STOP pilot) through 2014 in relation to the STOP implementation.

Increasing HIV testing can help identify those individuals previously unaware that they have HIV. As such, HIV testing volume is one of the indicators to assess the progress in the province's STOP HIV/AIDS program³.

Methods

HIV, HCV and syphilis testing data from 2006 through 2014 performed at the Public Health and Microbiology & Reference Laboratory (PHMRL) in BC were extracted March 9, 2015 and analyzed.

Methods cont'd

PHMRL performs over 95% of HIV and HCV screening tests and over 99% of syphilis screening tests in BC.

A total of 1,812,791 anti-HIV, 1,367,761 anti-HCV and 1,489,353 rapid plasma reagin (RPR) syphilis screening tests were included in the analyses.

Because we suspected the slopes for testing volumes to differ before and after the implementation of STOP, piecewise regression⁴ method was used to evaluate the trend in testing volumes. In the model, calendar year and month predicted number of tests for each screening test type. The change points were estimated through the model.

Results

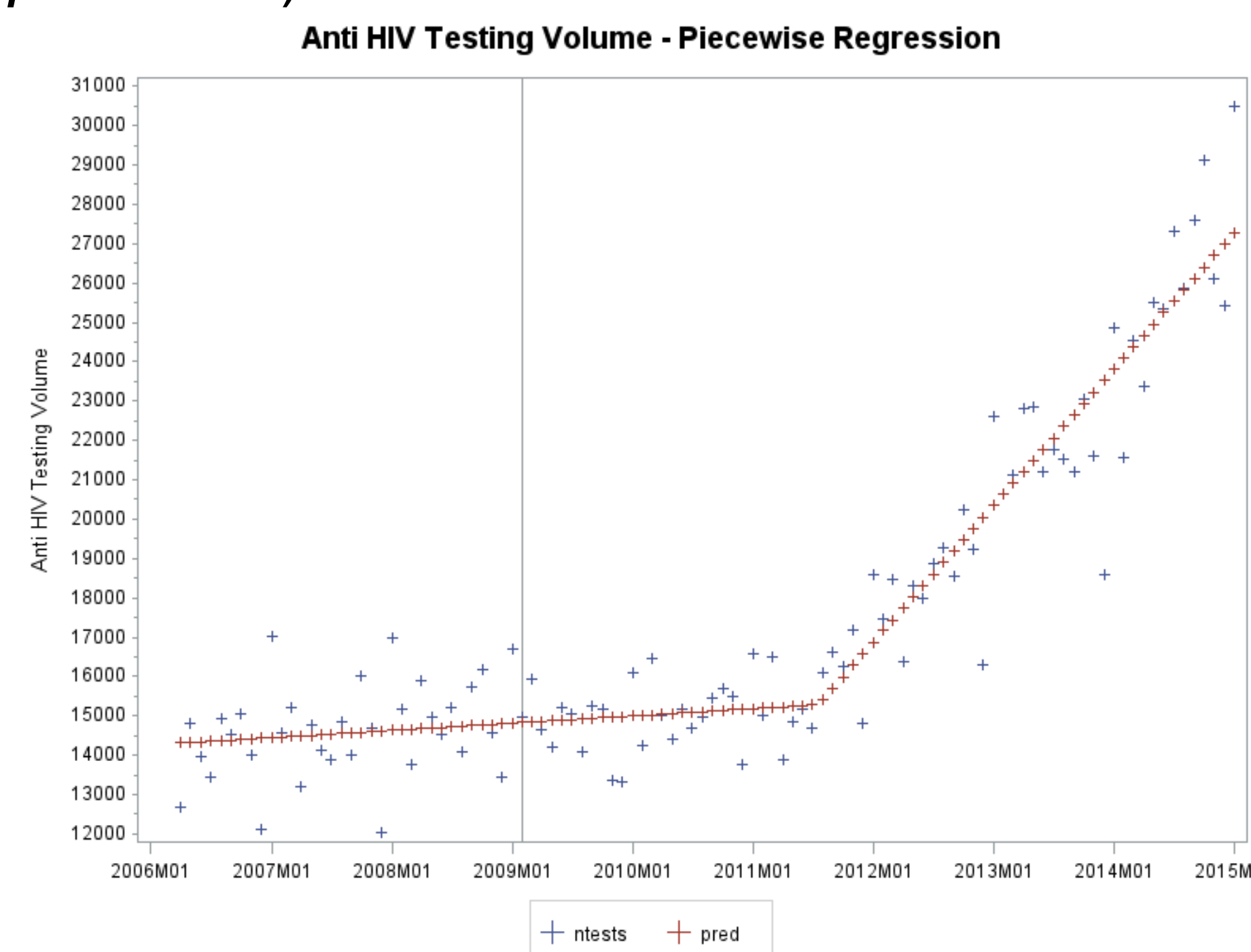
Yearly Test Volumes and Percent increases from Prior Year

Year	% increase from prior year		% increase from prior year		% increase from prior year	
	anti-HIV	anti-HCV	anti-HCV	RPR (syphilis)	RPR (syphilis)	
2006*	125555	-	88861	-	98400	-
2007	174410	-	125432	-	141553	-
2008	180581	4%	131706	5%	152687	8%
2009	177865	-2%	137999	5%	155919	2%
2010	181553	2%	143843	4%	160294	3%
2011	187653	3%	151503	5%	169992	6%
2012	219612	17%	173378	14%	186834	10%
2013	258958	18%	199893	15%	204219	9%
2014	306604	18%	215146	8%	219455	7%
TOTAL	1812791		1367761		1489353	

*Laboratory systems changed April 2006. For 2006, only data from April through December are included. 2007 is the first complete year of data.

A significant change in testing trends for HIV, HCV and syphilis occurred between 2011 and 2012 based on model predicted change points.

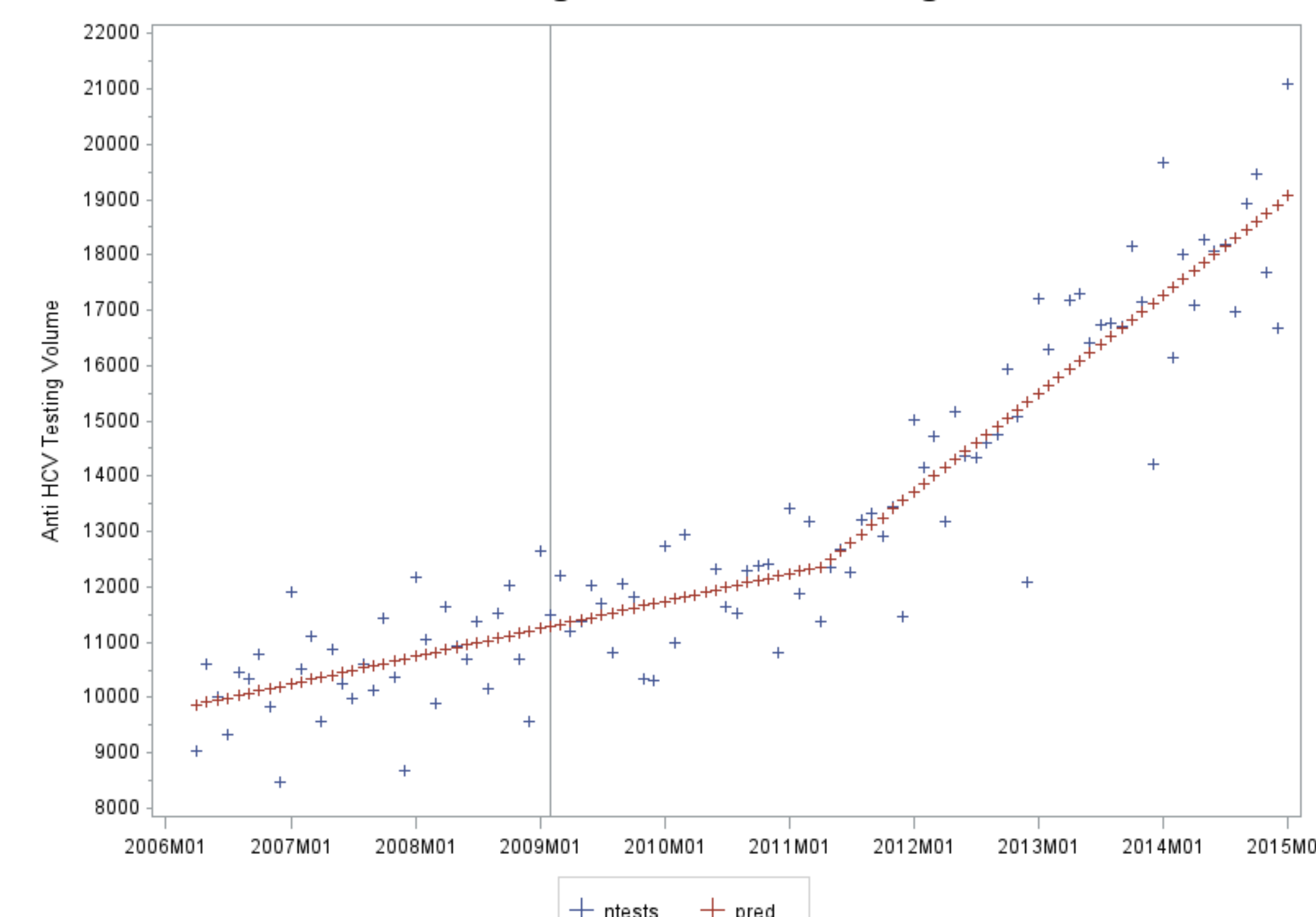
HIV testing increased significantly after the change point (unstandardized $\beta=8.99$, $p < .0001$).



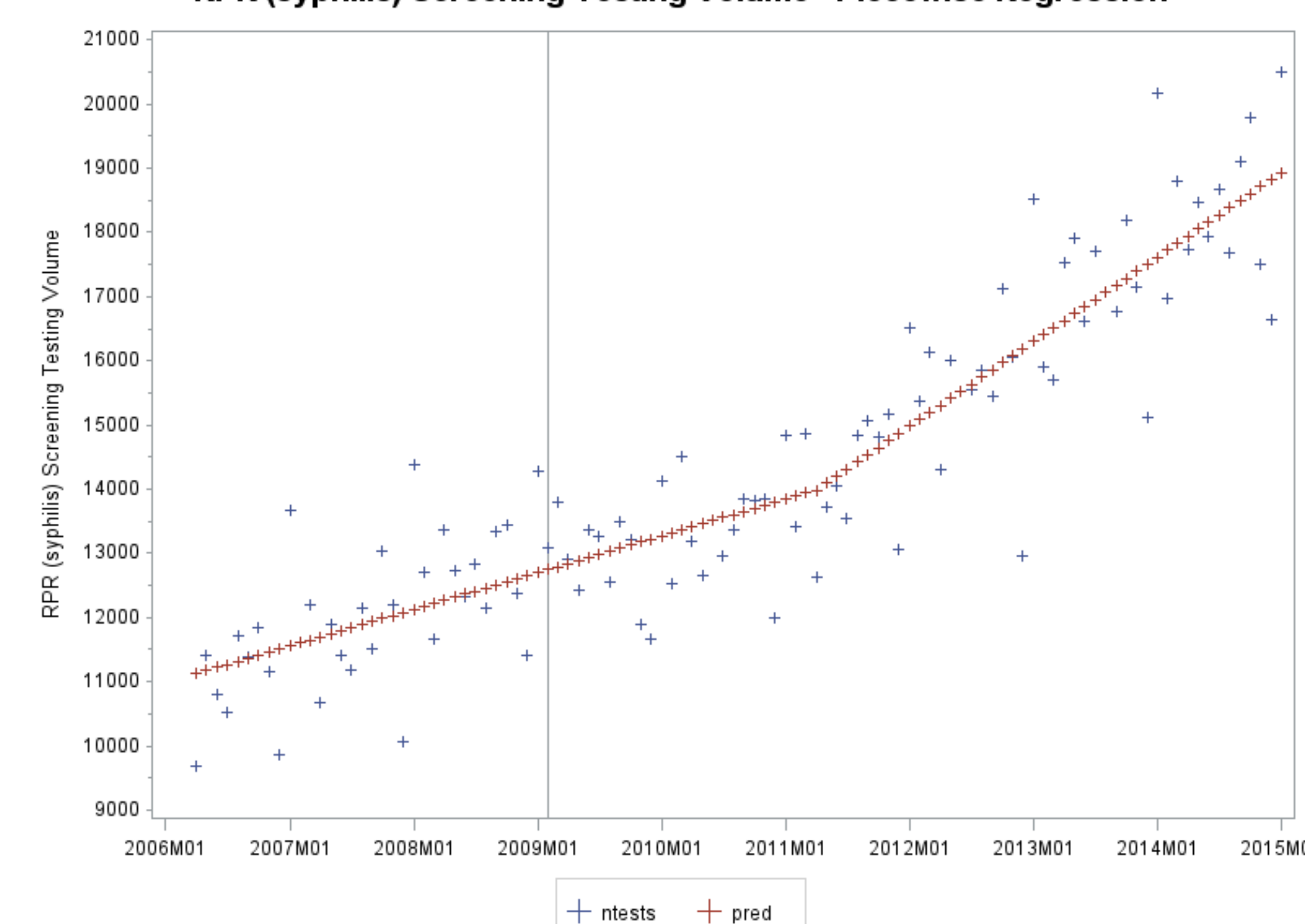
Significant increasing trends for both HCV (unstandardized $\beta = 3.53$, $p < .0001$) and syphilis (unstandardized $\beta = 2.04$, $p < .0001$) testing were noted after the change point.

Contact Information:
Theodora B. Consolacion, Ph.D., Epidemiologist,
Clinical Prevention Services, BCCDC theodora.consolacion@bccdc.ca

Anti HCV Testing Volume - Piecewise Regression



RPR (syphilis) Screening Testing Volume - Piecewise Regression



The slope for HIV test volumes is the steepest reflecting the STOP HIV/AIDS testing strategy, while the less steep slopes of HCV and syphilis are indicative of syndemic illnesses related to the shared risk factors for some of the at-risk groups.

From 2012 to 2014, an outbreak of syphilis likely influenced the increase of RPR testing. Increased HCV testing volumes were also influenced by 2012 CDC Atlanta recommendations for baby boomer screening⁵.

Conclusion

Significant increases in HCV and syphilis testing corresponded with increases in HIV testing, suggesting a simultaneous expansion in awareness and testing of related infections.

Roughly a 2 year lag is noted between the implementation year and change point estimated.

Increased co-testing of HIV with syphilis may have resulted in improved detection of syphilis during the outbreak occurring in BC.

References

- Public Health Agency of Canada. *Summary: Estimates of HIV Prevalence and Incidence in Canada, 2011*. Surveillance and Epidemiology Division, Professional Guidelines and Public Health Practice Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2012. Available at: <http://www.phac-aspc.gc.ca/aids-sida/publication/survreport/estimat2011-eng.php>. Retrieved 2015-06-24.
- Cohen MS, Smith MK, Muessig KE, Hallett TB, Powers KA, Kashuba AD. Antiretroviral treatment of HIV-1 prevents transmission of HIV-1: where do we go from here? *Lancet*. 2013;382(9903):10.1016/S0140-6736(13)61998-4. doi:10.1016/S0140-6736(13)61998-4.
- BC Ministry of Health. *From Hope to Health: Towards an AIDS-free Generation*. December 2012. Available at: <http://www.health.gov.bc.ca/library/publications/year/2012/from-hope-to-health-aids-free.pdf>. Retrieved July 23, 2013.
- Schwarz, C.J. *Regression - hockey sticks, broken sticks, piecewise, changes points*. In *Course Notes for Beginning and Intermediate Statistics*. 2014; 1186-1204. Available at: <http://people.stat.sfu.ca/~cschwarz/Stat-650/Notes/PDFbigbook-R/R-part018.pdf>. Retrieved 2015-06-24.
- Smith BD, Morgan RL, Beckett GA, et al. Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945-1965. *MMWR Recommendations and Reports*. 2012;61 RR04:1-18.