



National Collaborating Centre
for Infectious Diseases

Centre de collaboration nationale
des maladies infectieuses

Reflections on the Development of the HIV Cascade Measures

Meeting Proceedings

April 25-26, 2017

Winnipeg, Manitoba.



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National Collaborating Centre for Infectious Diseases

In partnership with

Public Health Agency of Canada

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Contents

Background 1

Reflections on the Development of the 90-90-90 Measures 2

 Setting the Context 2

 Agenda & Proceedings 3

 Approaches and Lessons Learned by provinces and territories 3

 Table 1: Approaches and Data sources used by the jurisdictions present at the event..... 4

 Table 2: Definitions of 90-90-90 indicators across jurisdictions 7

 Challenges and Opportunities..... 9

 Next Steps 10

Conclusions 11

NCCID’s contribution in moving forward 11

PHAC future planned activities 12

References 13

Annex 1 – Agenda 15

Annex 2 – Evaluation Results 17

Background

In 2014, the Joint United Nations Program on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) established new global targets to generate momentum towards ending the AIDS epidemic by 2030. The targets were defined as follow: by 2020, 90% of all people living with HIV will know their status, 90% of those diagnosed will receive antiretroviral treatment, and 90% of those on treatment will have achieved viral suppression (1). Timely diagnosis and early HIV treatment initiation are critical pieces to achieve these targets. Successful antiretroviral treatment maintains undetectable viral load, improves the health of people living with HIV, and effectively prevents onward transmission of the virus (1-3). Achieving the 90-90-90 targets would mean that by 2020, at least, 73% of all people living with HIV would be virally suppressed, leading to an important reduction in HIV transmission and therefore predicting the end of the AIDS epidemic by 2030 (1). Nevertheless, HIV treatment alone is unlikely to fulfil this ambitious agenda. Working on approaches grounded in human rights and equity principles will be equally critical. Urgent efforts are required to scale-up prevention and harm reduction strategies in addition to improve HIV testing services, and linkage and retention to care. Issues such as stigma, discrimination, social exclusion, services accessibility, system gaps and community knowledge, and awareness must all be addressed before these targets can be reached. The 90-90-90 targets offer an effective framework to measure progress along the HIV continuum of care. By evaluating the degree to which people living with HIV move along the continuum of care and achieve viral suppression, these indicators will help guide HIV prevention and care efforts, and identify gaps and opportunities for interventions.

In Canada, the HIV epidemic is concentrated among specific populations. These includes gay and other men who have sex with men (MSM), people who use injection drugs, people from countries where HIV is endemic, Indigenous Peoples, people in prisons, youth at risk and women (4). Nevertheless, important regional variations exist in the distribution of prevalent and incident cases among specific populations and exposure routes. In British Columbia, Ontario, the Atlantic Provinces and Quebec, new HIV infections are concentrated mainly in MSMs; in Saskatchewan people who use drugs represent the majority of new infections with Indigenous people being over-represented in this exposure category (5, 6). In Manitoba and Alberta, new HIV infections are concentrated mainly in people who engage or have engaged in heterosexual sex, with disproportionate representation of Indigenous people and people from countries where HIV is endemic in this exposure category (5, 7). The majority of positive HIV test reports and reported AIDS cases in Canada have been concentrated in the four most populous provinces - Ontario, Quebec, British Columbia and Alberta, which account for approximately 86% of the general Canadian population (4). These four provinces together account for 93.3% of all positive HIV tests reported between 1985 and 2011 (4). However, Saskatchewan and Manitoba HIV diagnostic rates were amongst the highest in 2014 and 2015 (8).

On December 1, 2015, the Minister of Health marked World AIDS Day by announcing that Canada would endorse and support UNAIDS/WHO 90-90-90 targets (9). A year later, the Public Health Agency of Canada (PHAC) released the first national 90-90-90 estimates (10). By working closely with the provinces, territories and other government departments to develop the 90-90-90 measures, PHAC estimated the number of persons living with HIV in Canada and the percentages of people diagnosed, on treatment, and virally suppressed at the end of 2014. From the estimated 65,040 people living with HIV in 2014 (plausible range: 53,980 to 76,100), 80% (76% to 87%) were diagnosed for HIV, 76% (70% to 82%) of persons diagnosed with HIV were on treatment, and 89% (84% to 93%) of persons on treatment had suppressed viral load (10). Therefore, in 2014 in Canada, approximately 54% of people living with HIV had attained viral suppression.

Reflections on the Development of the 90-90-90 Measures

Setting the Context

The 90-90-90 initiative builds on previous efforts for PHAC to develop national measures for the HIV Cascade of Care. In 2011, the HIV Cascade of Care emerged as an evaluation framework to identify where delays occur along the HIV continuum of care (11, 12). The HIV Care Cascade comprised six components, and includes the three 90 targets; 1) the numbers and percentages of people diagnosed with HIV (1st 90), 2) linked to care, 3) retained to care, 4) receiving HIV treatment (2nd 90) and 5) virally suppressed (3rd 90). In 2014, PHAC convened a technical working group to better understand provincial/territorial data structure and data sources in each jurisdictions and identify a set of national indicators that could be used across provinces and territories to measure the HIV Cascade of Care. The group met periodically between 2014 and 2016 and identified a proposed set of national indicator definitions.

In August 2016, the first exercise to measure the national 90-90-90 estimates at the end of 2014 began and PHAC engaged with provinces, territories and other government departments (10). The first 90 was built on national estimates of people living with HIV in Canada at the end of 2014, previously developed using HIV surveillance data reported by provinces and territories, estimated deaths among persons living with HIV, and statistical modelling (10). The second and third targets required bringing together additional clinical, laboratory and administrative information provided by provinces and territories such as 1) centralized HIV care program data; including linked treatment and HIV laboratory data; 2) provincial antiretroviral drug prescription data linked to HIV laboratory data; 3) unlinked data from drug prescription databases, laboratories, and HIV clinics; and 4) cohorts of diagnosed persons engaged in HIV care (10).

Agenda & Proceedings

To provide an opportunity to debrief and share lessons learned from the development of the first national 90-90-90 estimates, the Surveillance and Epidemiology Division of PHAC approached the National Collaborating Centre for Infectious Diseases (NCCID) to host a knowledge exchange event. The intent was to provide an opportunity for provinces and territories to learn from each other's experiences, review key challenges and discuss strategies and solutions to enhance data sources, improve future estimates and discuss ways forward.

The specific objectives of this 2-day event were:

- To review together key challenges and lessons learned during the development of the national and provincial 90-90-90 measures
- To exchange knowledge and share experiences and approaches related to HIV cascade measurement among the different jurisdictions
- To discuss anticipated plans for future measures and identify opportunities to improve previous methods
- To discuss the interpretation of the cascade and how the estimates could be used to inform programs and policies

The complete agenda can be found in Annex 1.

Twenty-one participants gathered in Winnipeg, April 25-26, 2017, to share provincial and territorial experiences with the development of the provincial and national 90-90-90 estimates. During the first day, PHAC reviewed the national 90-90-90 estimates process and delegates from the four most populated provinces – Québec, Ontario, Alberta and British Columbia – and four less populated provinces/territory – Saskatchewan, Manitoba, New Brunswick and Northwest Territories – described the approaches developed in their jurisdiction and the challenges they overcame. During the second day, PHAC discussed the plans for updating the national estimates and participants shared their next steps for future cascade surveillance. The results of the participant evaluations can be found in Annex 2.

Approaches and Lessons Learned by provinces and territories

Provinces differed in their 1) capacity and structure in place to measure the estimates, 2) definitions of indicators due to varying data sources, and 3) stage of advancement to access data and develop accession processes. As a result, each province developed a different approach to obtain and link the necessary datasets (Table 1) and measure the 90-90-90 estimates. Where possible, definitions developed by the PHAC working group were used, but definitions varied between jurisdictions (Table 2).

When appropriate, PHAC adjusted the estimates to take into account some unique situations in each jurisdiction. Because definitions, data systems, type of data available, and capacity to link information from different sources varied across jurisdictions, the national 90-90-90 estimates need to be interpreted within the context of plausible ranges.

Table 1: Approaches and Data sources used by the jurisdictions present at the event.

Provinces/Territories	Datasets
<p>British Columbia BC generates quarterly monitoring reports of the complete HIV Cascade of Care since 2012. Linked databases from several sources are used to build the cascade of HIV care. The British Columbia Ministry of Health (BC MOH) facilitates linkage and preparation of the de-identified individual-level database and the BC Centre for Excellence in HIV/AIDS (BC CfE) conducts the final analysis. Reports are stratified by Health Authority, age, gender and HIV risk group. Provincial funding and external grants made the development and sustainability of the HIV Monitoring Quarterly Reports possible (13). http://www.cfenet.ubc.ca/hiv-monitoring-quarterly-reports-first-quarter-2017</p>	<ul style="list-style-type: none"> -HIV Diagnostics - BC CfE -HIV testing - BC Centre for Disease Control (BC CDC) -Antiretroviral treatment (ART) dispensations - BC CfE -Non-ART medications – BC PharmaNet -Viral Loads – St Paul’s Hospital viral lab – BC CfE -Physician Billing - Medical Services Plan, BC MOH -Hospitalizations -Discharge Abstract Database, BC MOH -Deaths - Vital Statistics Database, BC MOH
<p>Alberta AB first measured the provincial 90-90-90 estimates in 2016 to contribute to the national effort. Six databases were accessible by Alberta Health to measure the 90-90-90 estimates and were linked with unique personal health numbers.</p>	<ul style="list-style-type: none"> -Diagnosis – Communicable Disease Reporting System (CDRS) -ART Dispensations – Pharmaceutical Information Network -Viral Loads – Provincial Laboratory for Public - Health (Provlab), Calgary Lab Services (CLS) -Deaths and out-migration – Alberta Health Care Insurance Plan (AHCIP) population registry files -Deaths– Vital Statistics Database, CDRS
<p>Ontario In ON, the work around measuring the 90-90-90 estimates and HIV Cascade of Care falls within the Ontario Epidemiology and Surveillance Initiative (OHESI), created in 2014. OHESI is a new provincial collaboration between agencies involved with HIV epidemiology and surveillance in Ontario. These agencies include Public Health Ontario (PHO), Ontario HIV Treatment Network (OHTN), Ontario Ministry of Health and Long-Term Care, and PHAC. http://www.ohesi.ca/</p>	<ul style="list-style-type: none"> -HIV Datamart – created by integrating Public Health Ontario Laboratory’s diagnostic and viral load databases and linking records at individual-level. -Ontario HIV Laboratory Cohort – created using HIV Datamart, represents a cohort of diagnosed people with HIV to monitor engagement in HIV Cascade of Care over time. Individuals living with HIV enter the laboratory cohort if they have a confirmed nominal HIV-positive diagnostic test (1985-2015), or HIV viral load test (1996-2015), excluding non-nominal and anonymous diagnostic tests.

Provinces/Territories	Datasets
<p>Québec In 2016, it was not possible for QC to provide data on the 90-90-90 estimates, as they were not available¹. <i>Le service de lutte contre les ITSS</i> from the Ministère de la Santé et des Services Sociaux (MSSS), the Institut National de la Santé Publique (INSPQ) and the Laboratoire de Santé Publique du Québec (LSPQ) have elaborated a Surveillance Plan to access and link the necessary datasets. The Surveillance plan is currently undergoing the approval process.</p>	<p>The Surveillance Plan proposes to access:</p> <ul style="list-style-type: none"> -Québec HIV Surveillance program – INSPQ -Fee-for-Service Medical Services - Régie de l'assurance maladie du Québec (RAMQ) -Pharmaceutical services – RAMQ -Insured Person Registration File – RAMQ -Eligibility file for Drug Insurance – RAMQ -Eligibility file for Health Insurance – RAMQ -HIV lab tests confirmations – LSPQ -Viral loads – LSPQ -Deaths - Vital statistics Database, MSSS
<p>Manitoba MB first measured the provincial 90-90-90 estimates in 2016 to contribute to the national effort. Manitoba Health, Seniors and Active Living led the initiative with the collaboration of the Manitoba HIV Program and Cadham Provincial Laboratory (CPL).</p>	<ul style="list-style-type: none"> -Estimated deaths – Statistics Canada -Number in care – Manitoba HIV Program -Number on drugs – Drug Program Information Network Database -Viral loads - CPL
<p>Saskatchewan SK first measured the provincial 90-90-90 estimates in 2016 to contribute to the national effort. The Population Health Branch at the Ministry of Health was mandated with measuring the estimates. Given the difficulties to access and link the data sources in time, methods were developed using proxy data.</p>	<ul style="list-style-type: none"> -HIV Diagnosis - Ministry Notifiable Disease Data -Number on drugs - Ministry outpatient prescription drug data (included First Nations and non-First Nations) -Test records and Viral loads – Saskatchewan Disease Control Laboratory Data

¹ Québec was still included in the national estimates, but estimates were based in part on the distribution of persons in care within HIV clinics in Montreal and in part on estimates from PHAC

Provinces/Territories	Datasets
<p>New Brunswick</p> <p>In NB, the request to measure the 90-90-90 estimates came to the Communicable Diseases Branch of the Public Health office, which were mandated to provide the first provincial estimates in 2016. Due to short timeline, data sources could not be linked. The epidemiologist at the Communicable Diseases Branch reached out to Infectious Diseases (ID) Physicians working in Regional Health Authorities (RHA), requesting specific information. The province received aggregated data from the service providers.</p>	<p>Information requested to ID Physicians:</p> <ul style="list-style-type: none"> -The number of HIV patients they were following -Of those how many on ART -Of those treated, how many had suppressed viral load
<p>Northwest Territories</p> <p>In NWT, the federal request went to the Department of Health and Social Services, in the Government of NWT. The Communicable Disease Consultant (CDC), responsible for following up all newly diagnosed or newly reported HIV cases, was assigned the responsibility for assisting federal colleagues in the production of the 90-90-90 measures in 2016. The information was obtained and linked by the CDC. Telephone interviews with health care providers were conducted to complete and validate the information.</p>	<ul style="list-style-type: none"> -Prevalent cases - NWT Information Services/Health Insurance Registry (HMIS) -Confirmed prevalent cases - NWT Integrated Public Health Information System (iPHIS) -Identification of health care providers - HIV/AIDS case reports -Confirmed cases, deaths, ART, and viral load - Interviews with healthcare providers -Viral load - Stanton Territorial Hospital Lab and Alberta Provincial Lab data - Deaths - NWT Vital Statistics

Note: This table includes the approaches undertaken by the provinces/territory participating to the event. It was not possible to have representation from all provinces/territories.

Table 2: Definitions of 90-90-90 indicators across jurisdictions

	1 st 90	2 nd 90	3 rd 90
PHAC, Working Group definitions	Persons diagnosed with HIV to end 2014 and alive	Persons with ≥ 1 antiretroviral treatment (ART) in 2014	Persons with latest viral load (VL) < 200 in 2014
British Columbia	Defined as persons with one of the following: (i) confirmed HIV-positive test; (ii) detectable plasma viral load (iii) HIV-related medical services plan billing or hospitalization; (iv) reported AIDS-defining illness; (iv) antiretroviral treatment dispensation	At least two ART dispensed ≥ 3 months apart in 2014	No detectable VL for ≥ 3 months in 2014
Alberta	Defined as total HIV reported cases at the end of 2014, minus estimated deaths and out-of-province migration	At least one ART prescription in 2014, excluding persons presumed to be on PEP or PrEP	VL < 200 copies/mL on last test in 2014
Ontario	Main estimate : Confirmed HIV-positive diagnostic test (nominal), <u>or</u> HIV VL test, <u>and not</u> administratively lost to follow-up* after 2 years Upper estimate: Confirmed HIV-positive diagnostic test (nominal or non-nominal); <u>or</u> HIV VL; <u>and not</u> administratively lost to follow-up* after 3 years * Defined as having no VL test in a specified number of years, and no VL test in later years. Accounts for death and out-migration.	Main: Documented* on treatment on last VL test, <u>or</u> treatment status not documented and suppressed on last VL test Upper: Documented* on treatment on any VL, <u>or</u> treatment status not documented and suppressed on any VL Lower: Documented* on treatment on all VL tests, <u>and/or</u> treatment status not documented and suppressed on all VL tests * ART status is documented on VL test requisition forms by submitting provider, and	Main: VL < 200 copies/mL on last VL test, and (known on treatment, or treatment status not documented) on last VL test Upper : VL < 200 copies/mL on any VL test, and (known on treatment, or treatment status not documented) on any VL test Lower: VL < 200 copies/mL on all VL tests, and (known on treatment, or treatment status not documented) on all VL tests

		is missing for 17-20% of forms.	
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	1 st 90	2 nd 90	3 rd 90
Québec	Modeling based on HIV surveillance data including key populations	Number of patients receiving ART	Number of people with VL undetectable (< 20 copies/ml) or suppressed (< 200 copies/mL)
Manitoba	Total HIV cases reported by MB to end 2014 minus deaths	At least one ART prescription in 2014	VL <200 copies/mL on last test in 2014
Saskatchewan	SK estimate of persons diagnosed with HIV who had a VL test in 2014, plus HIV-positive persons who had SK Disease Control Laboratory test records for other services since 2014	Number of people with at least one prescription dispensed for HIV medications in 2014, adjusted for PEP and PrEP.	Number of people with a viral load <200 copies/mL in 2014
New Brunswick	Infectious disease clinicians provided number of people seen for HIV care in 2014	Persons with at least one ART prescription in 2014	Viral load <200 copies/mL on last test in 2014
Northwest Territory	Infectious disease clinicians provided number of people seen for HIV care in 2014	Persons with least one ART prescription in 2014	Viral load <200 copies/mL on last test in 2014

Challenges and Opportunities

This section summarizes the challenges and opportunities behind the development of national/provincial/territorial strategies to measure HIV 90-90-90 targets as reported by the participants during the two days.

Data accessibility – Measuring the 90-90-90 indicators requires accessing and linking multiple data sources (i.e. drug prescriptions, clinical records, laboratory records, administrative databases), which are centralized to varying degrees in the different provinces/territories. In each province/territory, a Public Health Act provides a legislative framework to conduct public health functions, including communicable disease prevention and control and health surveillance, while protecting health information privacy. Ethical and legal conditions under which data collection and access are permitted varies between jurisdictions according to their Public Health Act, and their application and interpretation. All jurisdictions reported having to deal with regulatory challenges when defining their strategy to calculate the 90-90-90 estimates. Among the barriers reported were the inability to access vital statistics, the lack of knowledge about who legally owns datasets, the lack of mechanisms to support dataset linkage, and the complexity of approval and linkage processes. Developing a strategy to measure the 90-90-90 cascade requires long-term planning. The procedures to access, link and analyze the data were onerous and time-consuming, requiring the creation of new partnerships and the negotiation of legal agreements. In jurisdictions where systems were not already in place, the short timeline to produce the estimates proved to be challenging. Learning from the long-standing experience of the Quebec Integrated Chronic Disease Surveillance System (14) and creating central HIV data registries were solutions suggested to alleviate future measuring exercises.

Variability and Comparability across jurisdictions – Because the type of data available varied across jurisdictions, indicator definitions and approaches had to be adapted to each unique situation. As a result, provincial and territorial estimates are not comparable and important variabilities were introduced in the national indicators, explaining the wide range of the estimates. Participants recognized that the estimates would need to be refined to monitor effectively the successes and failures of interventions and programs. Establishment of national Gold Standards for methods and definitions, assessment of definition sensitivity to improve comparability, and identification of more data sources for validation would help achieve this refinement. Until then, yearly measurements of the 90-90-90 indicators were deemed excessive as unlikely to capture progress. Nevertheless, participants agreed that the 2016 exercise was a good start to evaluate the current state of national and provincial HIV responses, and that the work should continue.

Technical challenges – Each of the estimates encountered their own layer of technical challenges. When trying to validate the number of people diagnosed with HIV (1st 90) provided by PHAC, some jurisdictions reported being unable to account for deaths, migration, and non-nominal and anonymous tests. The challenges around calculating the number of people receiving ART (2nd 90) include having to deal with

multiple federal, provincial and territorial drug plans and private insurance, being unable to distinguish ART prescriptions for HIV treatment from post-exposure prophylaxis (PEP), pre-exposure prophylaxis (PrEP) and Hepatitis B treatment, having to use incomplete pharmaceutical databases, and accounting for loss in follow-up. Finally, the challenges described for measuring the number of people on treatment with suppressed viral load (3rd 90) where the impossibility to link administrative records to laboratory records and adjusting definition for potential clinical guidelines changes. Participants reported that another challenge reside in the structure of some dataset. Even though accessible, information could not always be extracted from some data sources.

Population/geography-specific data – Participants spoke to the importance of incorporating regional and key population estimates to the current measures in order to focus appropriately and equitably efforts and resources where most needed. Obtaining the necessary information to stratify the 90-90-90 estimates by key populations (people who used drugs, men who have sex with men, women, people in correctional facilities, people from endemic countries and Indigenous Peoples) was currently not possible for most. Greater involvement and meaningful engagement of key populations and people living with HIV in estimates refinement process, and governance and implementation of programs and interventions were seen as cornerstone to move forward the work around the 90-90-90 targets. Resuming PHAC HIV enhanced surveillance initiatives for key populations (I-Track, people who inject drugs, M-track, men who have sex with men, A- Aboriginal) and creating new partnerships to share and access data sources specific for key populations will help support that work. Meanwhile, participants noted the importance of remaining mindful of the burden these estimates may create on these specific populations, and ensure that this process does not create more stigma around them.

Mandate and Capacity – A striking difference existed between “bigger” and “smaller” jurisdictions in terms of capacity and resources dedicated to the 90-90-90 framework. Where bigger provinces had organizations, funding and resources in place to support the measurement process, and link and coordinate actions through the whole Cascade of Care (diagnosed, linked to care, retained to care, on ARV, virally suppressed), the smaller provinces struggled to get the process in place with a power of actions limited to surveillance and prevention. Reconciling the mismatched mandates between who is responsible to calculate the 90s and who has the power to act on them was highlighted as a challenge in smaller jurisdictions. Competing priorities also existed in smaller jurisdictions, and concerns were raised regarding how to draw capacity to measure the 90-90-90 indicators without harming other important programs. Encouraging the uptake of the Cascade report proved to be challenging, even in bigger jurisdictions, and effort will be needed to encourage buy-in at clinical and regional levels.

Next Steps

Common measures and refined estimates – Refining methods to calculate the estimates and defining common metrics that will allow for comparison across jurisdictions was noted as the next necessary steps. Participants voiced the need to create a National Network to continue build on the work initiated by the discontinued PHAC Working group. This network could provide a platform to coordinate efforts

across jurisdictions, support collaboration and interaction across disciplines and sectors, work collectively toward estimates refinement, and improve the transparency and timeline behind the national exercise.

Access to information – Participants discussed the need to better understand and compare how governmental policies and context can enable or impede access and linkage of data sources across provinces and territories. All emphasized the need to reduce administrative constraints in order to facilitate timely access to datasets, including key population-specific and geographical information. To enable this process, the general public and administrative managers need to overcome mistrust and fear of misuse and misinterpretation of data. Exploring how the interpretation and application of Public Health Acts can be revisited to better support access to information will be critical in this process.

Build on the momentum – Participants stated that the 90-90-90 targets should serve as a catalyst to improve the current responses to HIV in Canada as it pertains to combination prevention, testing, earlier ART initiation, retention in care and ART adherence, key populations engagement, and human rights advocacy. This first national exercise has helped establish a baseline to guide future work. Participants suggested engaging champions across the country to improve visibility of the national and provincial 90-90-90 targets and leverage stakeholders buy-in, general interest and resources to connect initiatives across the country, disseminate successes, identify scalable programs, and align policies. Through the creation of a National Network, cohesion and collaboration could be encouraged and sustained, and support to provinces and regions with limited capacity and resources provided.

Conclusions

The targets have been set in Canada, and attaining 90-90-90 will require coordinated actions across sectors and disciplines to overcome health, social and system challenges. Epidemiologists, clinicians, researchers, community organizations, implementers, and policy makers will need to come together for designing adapted strategies that leaves no one behind.

NCCID's contribution in moving forward

NCCID's role as a knowledge broker will be to continue support knowledge translation activities around the 90-90-90 national and provincial work. NCCID will continue connecting and listening to stakeholders in that process and contribute to disseminate evidence around best practices and enabling social, legal and structural environments. Concretely, NCCID will remain committed to this work through:

- The production of a provincial/territorial Public Health Act Environmental Scan to help understand how the interpretation and application of the acts can help support the measurement of the 90-90-90 targets;
- Contributing to the National Network efforts.

PHAC future planned activities

The Public Health Agency of Canada will:

- Continue to work closely with provinces and territories to refine the methodology and improve data sources to reduce uncertainty around estimates of HIV incidence, prevalence, and 90-90-90 measures and to develop estimates for key populations (e.g. Indigenous people);
- Support use of the 90-90-90 measures and associated estimates to guide the development of prevention and control programs.

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Annex 1 – Agenda

Knowledge Exchange on the Development of HIV Cascade Measures

Meeting hosted by the National Collaborating Centre for Infectious Diseases

25-26 April 2017

Alt Hotel, 310 Donald St, Winnipeg MB

Objectives:

- Review together key challenges and lessons learned during the development of the national and provincial 90-90-90 measures
- Exchange knowledge and share experiences and approaches related to HIV cascade measurement among the different jurisdictions
- Discuss anticipated plans for future measures and identify opportunities to improve previous methods
- Discuss the interpretation of the cascade and how the estimates could be used to inform programs and policies

Agenda Day 1 – Sharing experiences and lessons learned from gathering 90-90-90 estimates

8:00 – 8:30	Arrival and networking
8:30 – 8:45	Welcome and introductions; Objectives and overview of the meeting <i>Marissa Becker (NCCID)</i> <i>Marc-André LeBlanc (Meeting facilitator)</i>
8:45 – 9:15	Review and debrief of national 90-90-90 estimates process (Presentation and Q&A) <i>Claudia Rank (PHAC)</i>
9:15 – 10:30	Approaches and lessons learned from larger jurisdictions (Presentations and Q&A) <i>Bohdan Nosyk (BC); Mariam Osman (AB); James Wilton (ON); Karine Blouin (QC)</i>
10:30	BREAK
10:45 –12:00	Approaches and lessons learned from smaller jurisdictions (Presentations and Q&A) <i>Valerie Mann (SK); Carla Loeppky (MB); Rita Gad (NB); Myrna Matheson (NT)</i>
12:00	LUNCH

1:00 – 1:30	Reflections on the morning and brainstorming on key challenges that have emerged so far (Plenary discussion)
1:30 – 2:30	The experience of the 90-90-90 estimates process: Challenges and strategies for overcoming them (Small group discussion)
2:30	BREAK
2:45 – 4:00	Estimates and methods: similarities and differences between—and applicability across—larger and smaller jurisdictions (Report-back and Plenary discussion)
4:00 – 4:15	Wrap-up for Day 1

Agenda Day 2 – Moving forward: What’s next for 90-90-90 estimates?

8:30 – 8:45	Feedback from yesterday and overview of today
8:45 – 9:15	Plans for updated national estimates and 90-90-90 measures (Presentations and Q&A) <i>Claudia Rank (PHAC)</i>
9:15 –10:15	Issues moving forward with 90-90-90 measures (Presentations and Q&A) <i>Valerie Mann (SK); Carla Loeppky (MB); Rita Gad (NB); Myrna Matheson (NT); Bohdan Paul Nosyk (BC); Mariam Osman (AB); James Wilton (ON); Karine Blouin (QC)</i>
10:15	BREAK
10:30 –11:15	Identifying, interpreting and using estimates that are relevant and appropriate (Small group discussion)
11:15 – 12:00	Identifying, interpreting and using estimates that are relevant and appropriate (Report-back and Plenary discussion)
12:00	LUNCH
1:00 – 2:00	How do we improve collaboration and networking on HIV cascade measurements? (Plenary discussion)
2:00 – 2:15	Next steps
2:15 – 2:30	Participant feedback and evaluation

Annex 2 – Evaluation Results

The evaluation responses were favorable. The response rate was very high, 94% (17/18) when excluding NCCID staff.

The event was relevant to all attendees and the forum met the overall objectives.

- 88% agreed that the event provided them with an opportunity to share experiences, challenges and lessons learned in developing the 90-90-90 measures
- 100% agreed that the event helped them to learn more about other provinces/territories experience at developing the 90-90-90 measures
- 94% agreed that they were engaged to reflect on future plans for the 90-90-90 estimates and on the opportunities for improvement.
- 94% agreed that they were given the opportunity to talk about the process moving forward
- 82% agreed that they engaged to discuss the interpretation of the cascade and its use in informing program and policies.

When asked what was the most valuable aspect of the workshop, all participants really valued learning about other provinces/territories experiences and learned from their challenges and solutions. Comments also emphasized participants' appreciation for open group discussions, and mixed approaches to foster conversation (presentations, plenary discussion and small group discussion). A participant expressed the desire to hear about more specific examples of how the data was used by other jurisdictions and another would have like to see the meeting participants coming to an agreement on tangible next steps. A last one would have liked to see the meeting focusing on cascade measurement without deviating to interventions and programs, stating that this specific subjects would be another 2 days meeting in itself.

When asked what they were expecting to bring back, some participants listed concrete items

- Better understanding of other province approaches, challenges and limitations;
- Ideas on how to estimate the 1st 90;
- Info on the cascade process and gaps and ideas from other provinces about addressing those gaps;
- Technical approaches to improve cascade measurement;
- Methods to improve analyses;
- Methods to adjust technical work, support data sharing, and advocacy;
- Solutions from more populated provinces that have more resources.