# **Data use and Methods Cluster**

# **Denominators Team**

# **Scope of work**

**Rationale:**

PEPFAR operating units (OUs) are required to geo-prioritize resources to optimize PEPFAR’s impact by focusing efforts on prioritized subnational units (PSNUs) and prioritized age/sex bands and key populations. OUs are also required to track progress towards meeting global HIV program coverage goals (e.g. 90-90-90; 90% of all people living with HIV (PLHIV) know their HIV status, 90% of all people with diagnosed HIV infection receive sustained antiretroviral therapy, 90% percent of all people receiving ART have viral suppression) in targeted PSNUs by five year age/sex bands (ie. <1 M/F, 1-4 M/F, 5-9 M/F, 10-14 M/F, 15-19 M/F… 45-49 M/F, 50+ M/F). Both the micro-targeting and monitoring of PEPFAR-supported programs place increased importance on the availability of reliable, granular epidemiological data and estimates about PLHIV, new HIV infections and priority age/sex bands and key populations. In many cases, novel and/or innovative methods (e.g. modeling and machine learning) are needed to meet these data needs.

**Objectives:**

**Harmonizing accessibility:**

To provide leadership in the development of a transparent, appropriate and shareable platform for tools and estimates where analysts, countries and decision makers can easily gain new insights into PEPFAR data using state of the art analytic tools and access important data in time to impact program planning and monitoring and with lowest possible level of effort (LOE). This objective is supported by the following goals:

* Enhance data accessibility at the time of decision making.
* Enhance data accessibility to stakeholders.
* Enhance data accessibility as both a WIP (work in progress) and final product.
* Enhance data accessibility from multiple sources.
* Enhance documentation and transparency of methodology for estimation of both WIP and final product data.
* Streamline processes for selecting appropriate platform for data and tools.

**Platform for sharing and developing forward thinking methodologies:**

1. To provide a platform to connect different programmatic ICPI clusters and external stakeholders (field teams, epidemic control teams (ECTs), ST3 (short term task teams) and implementing agency and OGAC leadership to explore possibilities of collaboration and improvements to existing methodologies,
2. To provide a convening platform for forward thinking methodologies; and
3. To pro-actively work on innovative and rigorous methodologies, targeting general population, priority population, key populations at sub-national levels and finer age and sex bands.

These objectives are supported by the following goals:

* Connect different clusters and external stakeholders where appropriate to ensure timely sharing of estimates, methods, data and tools.
* Connect PEPFAR OUs to tools and methods developed by clusters and technical workgroups.
* Explore cutting edge methodologies (including but not limited to machine learning, dynamic modeling, network analysis) to develop epidemiological data and estimates for general population, key populations and priority populations—at subnational levels (where applicable) and finer age and sex bands (where applicable).
* Develop prototypes for innovative methods to share with the stakeholders and iteratively convert successful prototypes into products.
* Develop training materials and other resources to allow analysts in program clusters, monitoring and evaluation teams at agencies, and field teams to incorporate products into routine work when possible.

**Activities:** The denominators team will undertake the following activities:

* Develop processes that will enable better access to tools and data by stakeholders and PEPFAR OUs.
* Support PEPFAR OUs and Foreign Government Ministry’s of Health (MOHs) to produce HIV epidemiological data and estimates to inform the targeting and monitoring of PEPFAR-supported program toward 90-90-90—in the general population, key populations and priority populations—at subnational levels.
* Develop methodologies for estimating population size for general population, key populations and priority populations at finer age and sex bands.
* Develop innovative methods to produce population denominators by utilizing and collating multiple sources such as census, WorldPop, LandScan, etc. The goal is to provide stakeholders the ability to access different population sources to conduct sensitivity analysis and to choose an appropriate source based on multiple parameters like reliability, accessibility and acceptability.
* Develop rigorous and innovative methodologies to produce estimates for children living with HIV. The goal is to improve upon the existing methodology of estimating children living with HIV while accounting for the growth of the PMTCT programs.
* Estimate incidence using cutting edge technologies and machine learning algorithms utilizing routine ANC data, survey data, HIV testing and diagnosis data, case-based surveillance, and/or recency data.
* Model patient flow, clustering and grouping of PEPFAR sites for targeted monitoring and resource allocation.
* Improve access of PEPFAR OUs to the products developed by the team in a timely way to improve program planning and monitoring.

**Data inputs for team activities:** Data inputs for estimation and modeling activities would come from existing surveillance (e.g. ANC surveillance and key pop surveillance), survey (e.g. DHS and PHIA), program (site-level PEPFAR and national program indicators) and census/demographic data, including both PEPFAR-supported and non-PEPFAR-supported. To the degree possible, these data would be geo-identified.

**Expected outcomes/deliverables:** Expected outcomes/deliverables include:

* Process for selecting appropriate platform for accessing data and tools.
* Estimation and modeling methods and products that provide national and subnational estimates (at finer age and sex bands, where applicable) of
  + general population,
  + PLHIV,
  + children living with HIV,
  + young women and girls,
  + uncircumcised men,
  + Key population which includes – prisoners, MSM, FSW, PWID, and
  + incidence

**Duration of the team:** As needed to support countries and multilateral collaborations.

**Linkages to other teams:** One of the key objectives of the Denominators Team is to provide a platform to connect different interagency teams to collaborate and explore improvements to existing methodologies. The team will serve as a convening platform to connect different interagency teams, ICPI clusters, and communities of practice in order to ensure seamless flow of information and data. The team wishes to bring together people working on similar problems.The team will engage others clusters and clusters that require denominator data on priority populations (children living with HIV, young women and girls, uncircumcised men, etc.) to target and measure coverage of PEPFAR-supported interventions in these populations.

**Team composition:** The teamcomposition will reflect personnel from PEPFAR agencies who have historically worked in the epidemiology, estimation and modeling domains with UNAIDS and other partners. Potential composition would include:

* OGAC lead
* Modelers
* Demographers
* Epidemiologists
* Statisticians

In addition, the team may take occasional support from ICPI data managers, analysts and statisticians, as projects dictate.

**Analytical tasks:**

1. Subnational estimates (SNU2/SNU3):
   1. People living with HIV (PLHIV) and HIV prevalence by age and sex
   2. Children living with HIV (CLHIV) (<15) by age and sex
   3. Diagnosed/undiagnosed PLHIV
   4. Diagnosed/undiagnosed CLHIV
   5. Viral load (VL) suppression and viremia
   6. HIV incidence
   7. Expected number of births
   8. OVC populations
   9. Key populations (KP) estimates of PLHIV, HIV prevalence and population size
2. Evaluate robustness of routine VL data
3. Collection of PLHIV from COP Datapacks
4. Develop state of the art analytic tools to gain insight into PEPFAR data
   1. Machine learning
   2. Artificial Intelligence
   3. Dynamic Modeling
   4. Dynamic analytic dashboards (e.g., Shiny, etc.)
5. Improve access to tools and data to empower stakeholders and PEPFAR OUs

**Stakeholders:**

1. CDC - Laura Porter
2. UNAIDS - Mary Mahy
3. S/GAC - Irum F. Zaidi
4. USAID - Rachel Lucas

**Membership and Roles:**

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| --- | --- | --- |
| **Membership** | **Role** | **E-mail** |
| Joshua Davis - USAIDS | Co-Lead | [jodavis@usaid.gov](mailto:jodavis@usaid.gov) |
| Roma Bhatkoti - CDC | Co-Lead | [nli0@cdc.gov](mailto:nli0@cdc.gov) |
|  |  |  |
| **CDC** |  |  |
| Ian Fellows | Member | [ifellows@gmail.com](mailto:ifellows@gmail.com) |
| John P. Abellera | Member | [jla7@cdc.gov](mailto:jla7@cdc.gov) |
| Mohammed Mujawar | Member | lrz5@cdc.gov |
| James C. Houston | Member | [vie3@cdc.gov](mailto:vie3@cdc.gov) |
| Ray Shiraishi | Member | [fnf3@cdc.gov](mailto:fnf3@cdc.gov) |
| Travis Warren Lim | Member | [wvp3@cdc.gov](mailto:wvp3@cdc.gov) |
| Randy Yee | Member | [pcx5@cdc.gov](mailto:pcx5@cdc.gov) |
| Anubhuti Mishra | Member | [nme1@cdc.gov](mailto:nme1@cdc.gov) |
|  |  |  |
| **USAID** |  |  |
| Aaron Chafetz | Member | [achafetz@usaid.gov](mailto:achafetz@usaid.gov) |
| Noah Bartlett | Member | [nbartlett@usaid.gov](mailto:nbartlett@usaid.gov) |
|  |  |  |
| **UNAIDS** |  |  |
| Kim Marsh | Member | [MarshK@unaids.org](mailto:MarshK@unaids.org) |
| Ian Wanyeki | Member | [WanyekiI@unaids.org](mailto:WanyekiI@unaids.org) |
|  |  |  |
| **UNAIDS Reference Group** |  |  |
| Jeff Eaton | Member | [jeffrey.eaton@imperial.ac.uk](mailto:jeffrey.eaton@imperial.ac.uk) |
| Oliver Stevens | Member | o.stevens@imperial.ac.uk |
|  |  |  |
| **Census** |  |  |
| Athena Pantazis | Member | [athena.e.pantazis@census.gov](mailto:athena.e.pantazis@census.gov) |
|  |  |  |
| **PeaceCorps** |  |  |
| Yaa Obeng-Aduasare | Member | [yobengaduasare@peacecorps.gov](mailto:yobengaduasare@peacecorps.gov) |
|  |  |  |
| **ICPI** |  |  |
| Jasmine Buttolph | Member | [jbuttolph@peacecorps.gov](mailto:jbuttolph@peacecorps.gov) |
|  |  |  |
| **DoD** |  |  |
| Shaylee Mehta |  | shaylee.p.mehta.ctr@mail.mil |
|  |  |  |
| **Additional Members** |  |  |
| Scott Jackson | Member | [sjackson@baosystems.com](mailto:sjackson@baosystems.com) |
| Parviez | Member |  |
| Member 3 | Member |  |