

# Integrating Geospatial Technologies with Information Management Systems for the Development and Monitoring of AIDS Clinics in Africa

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The International Center for AIDS Care and Treatment Program (ICAP)

**GDEST Conference**

**Cape Town, South Africa**

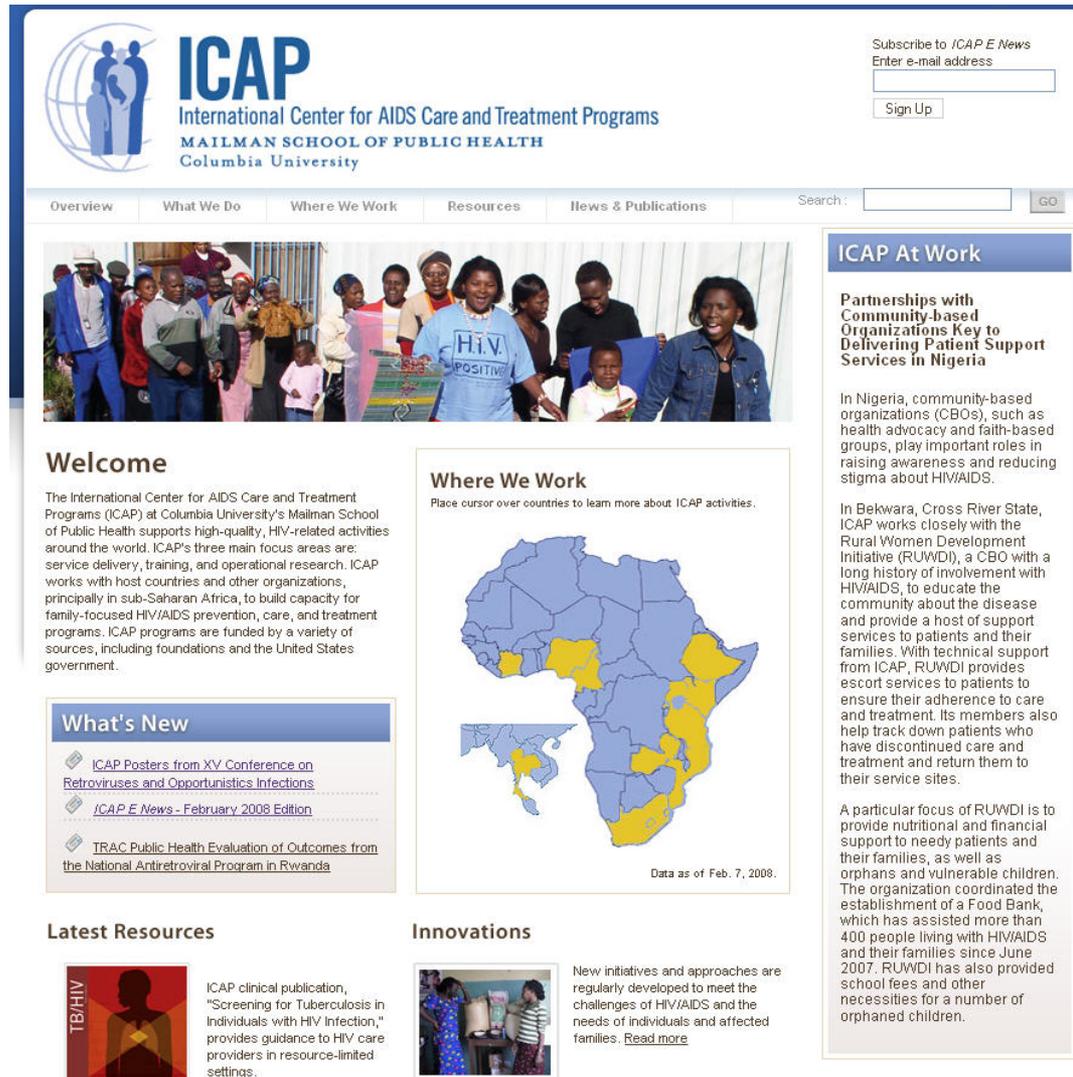
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# Background

- The Centre for International Earth Science Information Network (CIESIN) has recently entered into partnership with the International Center for AIDS Care and Treatment Programs (ICAP) at Columbia University's Mailman School of Public Health to integrate an online interactive mapping tool into their existing information management systems.
- ICAP primary mission is to support high quality, HIV-related activities around the world, focusing on three main areas:
  - Service delivery
  - Training
  - research
- ICAP works with host countries and other organizations (mainly sub-Saharan Africa) to build capacity for family-focused HIV/AIDS prevention, care, and treatment programs.

# The International Center for AIDS Care and Treatment Program (ICAP) <http://www.columbia-icap.org/>



The screenshot shows the ICAP website homepage. At the top left is the ICAP logo, which consists of a globe with two stylized human figures. To the right of the logo is the text "ICAP International Center for AIDS Care and Treatment Programs MAILMAN SCHOOL OF PUBLIC HEALTH Columbia University". On the top right, there is a subscription form for "ICAP E News" with a text input field for an email address and a "Sign Up" button. Below the header is a navigation menu with links for "Overview", "What We Do", "Where We Work", "Resources", and "News & Publications", along with a search box and a "GO" button. The main content area is divided into several sections: "Welcome" with a paragraph about ICAP's mission and focus areas; "Where We Work" featuring a map of Africa with several countries highlighted in yellow and a caption "Data as of Feb. 7, 2008."; "What's New" with a list of recent publications and news items; "Latest Resources" with a link to a clinical publication on TB/HIV screening; "Innovations" with a link to new initiatives for HIV/AIDS care; and "ICAP At Work" with a sub-header "Partnerships with Community-based Organizations Key to Delivering Patient Support Services in Nigeria" and a detailed text block describing ICAP's work in Nigeria and Bekwara, Cross River State. A large photograph of a group of people, including children and adults, is positioned on the left side of the main content area.



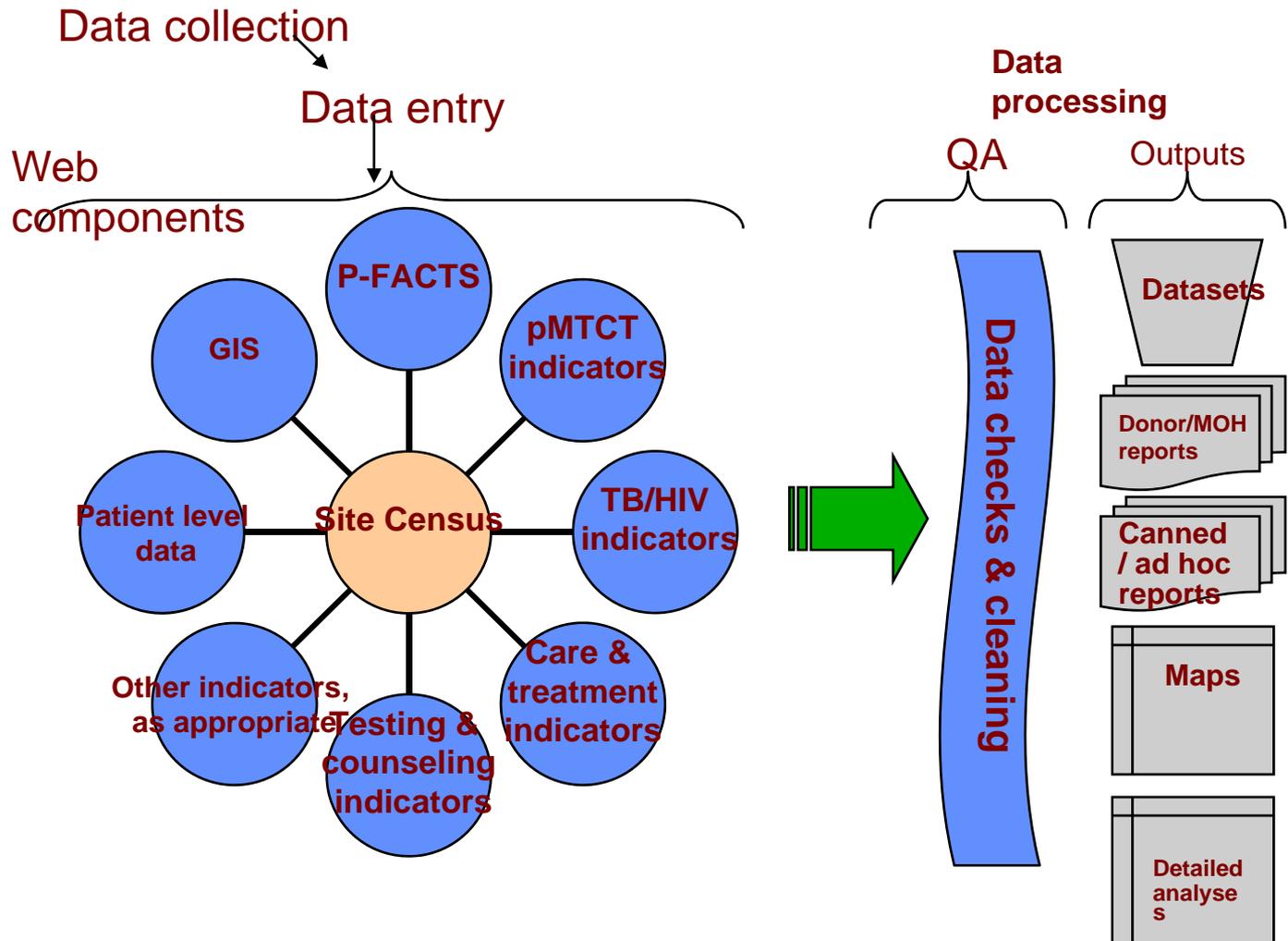
## **CHALLENGES**

- Data dissemination and use of data
- Some important aspects of programs are hard to capture with patient-focused or patient-driven indicators
- Multiple reporting demands

## **RESPONSES**

- Created Data Dissemination website
- Unified reporting system
  - *Combine reported data across programmatic areas to produce integrated analyses*
- Created a Program and Facility Characteristics Tracking System (PFaCTS)
  - *Info on program and facility characteristics are routinely and systematically captured using a standard instrument*

# Unified reporting system



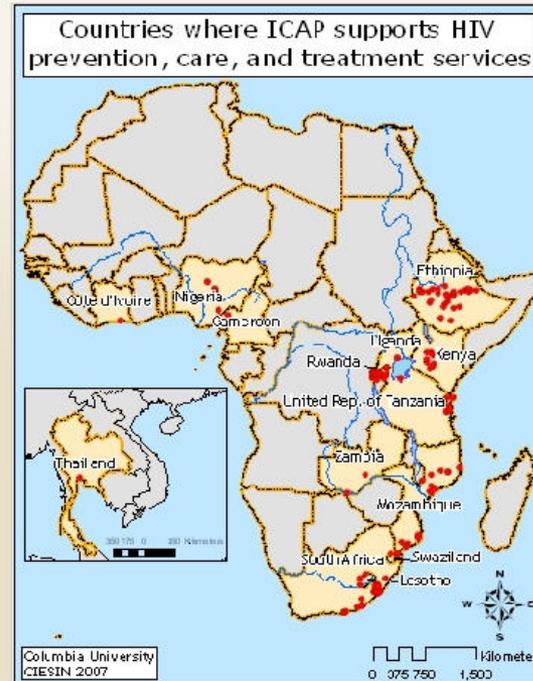
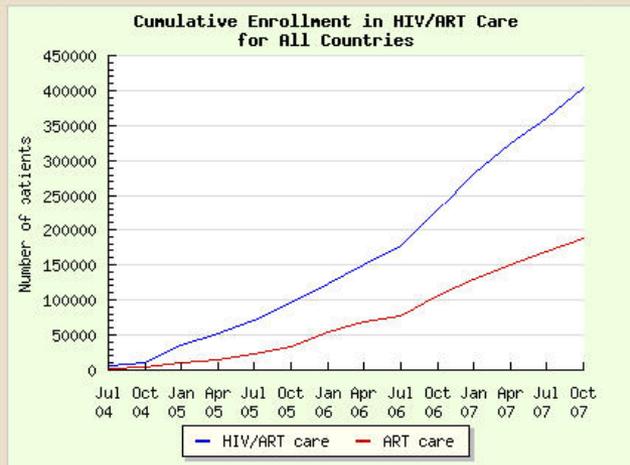
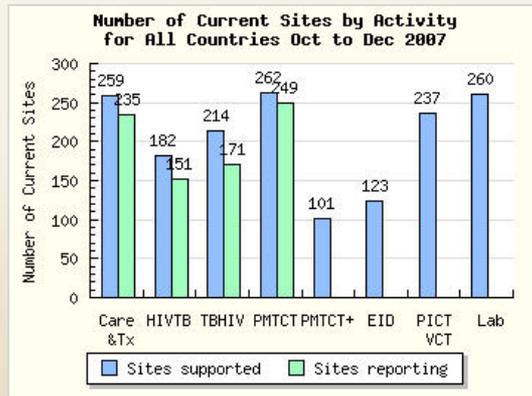
# Unified Reporting System

## Dashboard for all countries

[Navigate by Activities \(View All Sites\)](#) [Navigate by Site](#)

In order to minimize the download time of the dashboard, it is regenerated hourly. This means that any updates you have made will not appear on the dashboard for an hour.

Select a country:  ▼



If the number of sites on the map does not match the number of supported sites, coordinates for some sites are missing.

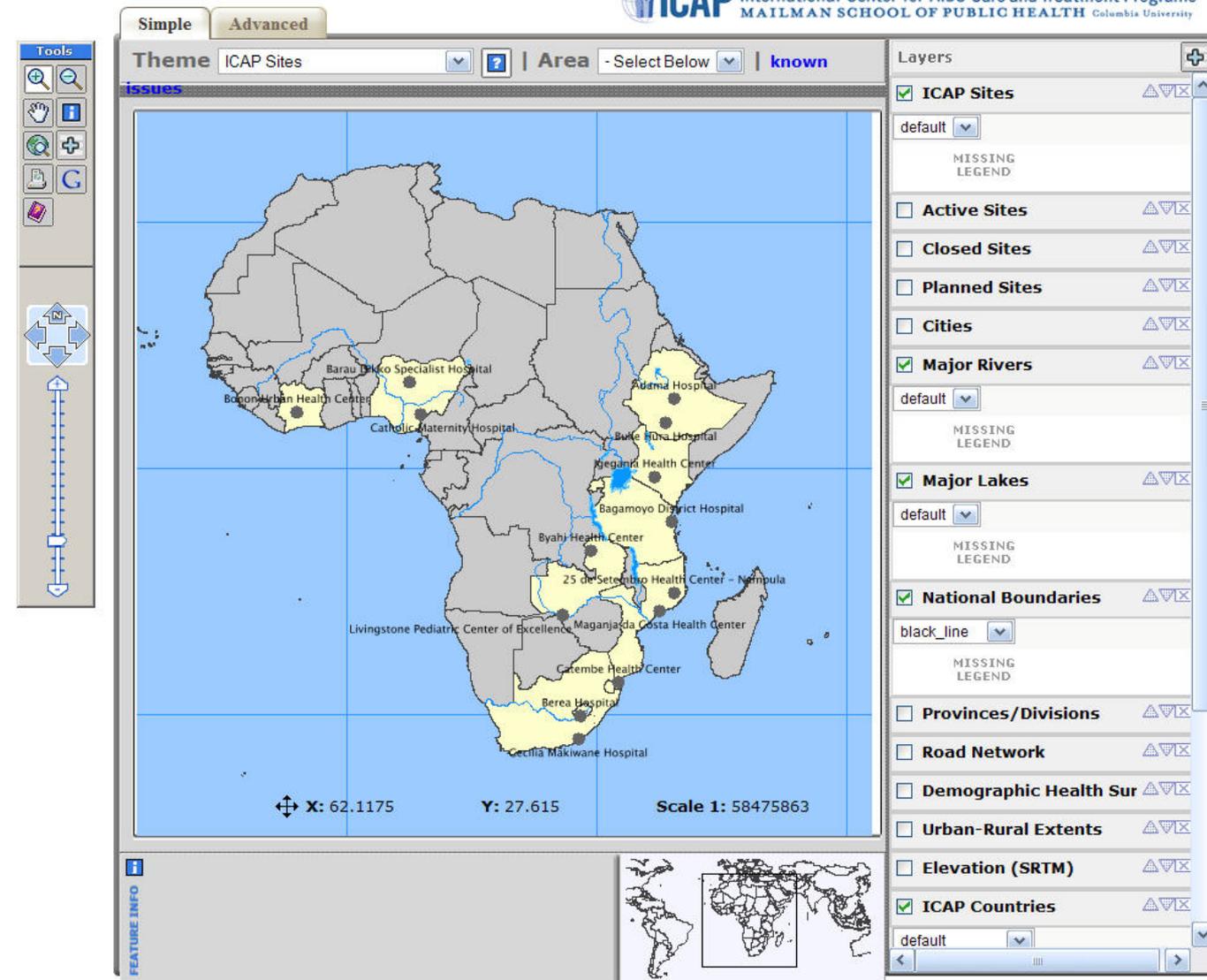
# Unified Reporting Table

Table of vital indicators for ICAP-supported activities in All Countries						
HIV care and treatment	Oct-Dec 2007	Jul-Sep 2007	Apr-Jun 2007	Jan-Mar 2007	Oct-Dec 2006	Jul-Sep 2006
Number of current sites supported	263	239	246	224	211	158
Number of current sites reporting	235	221	234	213	184	158
Number with active outreach	tbd	tbd	tbd	tbd	n/a	n/a
Number with adherence support	tbd	tbd	tbd	tbd	n/a	n/a
Number with peer educator program	tbd	tbd	tbd	tbd	n/a	n/a
COP 2007 Cumulative HIV Care Target	208,594	255,733	235,456	232,599	191,512	0
Cumulative number in care	403,266	360,209	324,591	280,588	229,490	177,415
Number currently in care	217,866	195,530	198,771	177,222	135,498	107,663
Proportion male	30 %	31 %	30 %	29 %	30 %	30 %
Proportion female	58 %	60 %	59 %	58 %	59 %	58 %
Proportion children	12 %	10 %	11 %	13 %	11 %	12 %
COP 2007 Cumulative ART Care Target	83,663	103,786	99,214	94,564	76,451	0
Cumulative number on ART	188,397	167,798	150,800	129,940	106,954	77,883
Number currently on ART	107,723	96,372	96,309	86,906	68,956	45,062
Proportion male	31 %	32 %	32 %	32 %	33 %	34 %
Proportion female	58 %	58 %	58 %	58 %	58 %	57 %
Proportion children	10 %	10 %	10 %	10 %	9 %	9 %
Median CD4 at ART initiation	140.8	142.5	143.2	133.5	148.2	152.4
Change in median CD4 after 6 months of ART	143.9	140.4	135.3	143.5	110.5	111.6
Change in median CD4 after 12 months of ART	170.5	174.6	167.3	156.7	144.7	135.8
Number died	8,384	7,230	6,156	5,636	4,092	2,509
Number LTF	14,214	10,909	11,508	9,511	7,880	3,443
Number unknown	3,026	1,881	3,100	3,528	2,439	1,550
Number transferred	8,671	7,001	5,488	4,148	3,160	2,166
Number of person-years on ART (all patients)	TBD	TBD	TBD	54,674	TBD	TBD

# Unified Reporting Tables

<b>TB Screening in Care and Treatment</b>	Oct-Dec 2007	Jul-Sep 2007	Apr-Jun 2007	Jan-Mar 2007	Oct-Dec 2006	Jul-Sep 2006
Number of current sites supported	213	194	174	150	134	n/a
Number of current sites reporting	171	163	149	121	0	n/a
Number of new patients enrolled into HIV care	24,484	23,312	19,680	18,086	n/a	n/a
Proportion of new patients screened for active TB at enrollment	65 %	61 %	54 %	48 %	n/a	n/a
Proportion screening positive for active TB	22 %	26 %	23 %	24 %	n/a	n/a
Proportion starting TB treatment	18 %	20 %	24 %	37 %	n/a	n/a
<b>HIV testing in TB clinics</b>	Oct-Dec 2007	Jul-Sep 2007	Apr-Jun 2007	Jan-Mar 2007	Oct-Dec 2006	Jul-Sep 2006
Number of current sites supported	181	167	95	55	3	n/a
Number of current sites reporting	151	133	86	67	3	n/a
Number of new patients enrolled into TB care with unknown HIV status	7,921	7,520	6,958	7,444	258	n/a
Proportion HIV tested	85 %	81 %	68 %	77 %	98 %	n/a
Proportion testing HIV positive	18 %	22 %	26 %	24 %	39 %	n/a
Proportion enrolled in HIV care and treatment program	69 %	64 %	66 %	74 %	143 %	n/a
<b>PMTCT</b>	Oct-Dec 2007	Jul-Sep 2007	Apr-Jun 2007	Jan-Mar 2007	Oct-Dec 2006	Jul-Sep 2006
Number of current sites supported	278	262	159	118	98	n/a
Number of current sites reporting	249	227	139	85	79	n/a
Number of pregnant women making their 1st visit to an antenatal clinic with PMTCT services	65,612	49,762	36,809	4,130	n/a	n/a
Number of pregnant women attending their first ANC visit at a PMTCT site who were tested	44,038	33,623	27,097	4,037	n/a	n/a
Number of pregnant women who tested positive for HIV at ANC	3,788	2,840	2,285	306	n/a	n/a
Number of PMTCT client partners who received HIV counseling and testing at ANC/PMTCT program	5,009	5,808	2,813	2,085	n/a	n/a
Number of HIV-positive pregnant women who received any prophylaxis	2,754	1,924	1,081	1,075	1,060	n/a
Number of HIV-positive pregnant women who received their CD4 test results	569	461	292	7	n/a	n/a
Number of HIV-positive pregnant women enrolled in a comprehensive HIV care and treatment program	967	741	425	93	26	n/a

# Interactive Mapping Tools for Health Care Management Systems



# Mapping Themes

The screenshot displays the ICAP mapping application interface. At the top, the 'Theme' dropdown menu is open, showing options: '- Select Below', 'ICAP Sites', 'Care and Treatment', 'TB-HIV', 'Site Census', and 'Mother-to-Child Transmission'. The 'ICAP Sites' option is currently selected. The map shows Africa with several ICAP sites highlighted in yellow, including Bara/Dikiko Specialist Hospital, Adama Hospital, Balé Hura Hospital, Kebridehat Hospital, Avega Clinic, Mgambo Health Centre, Bagamoyo District Hospital, Byahi Health Center, Ikwiriri Health Center, 25 de Setembro Health Center - Namibia, Livingstone Pediatric Center of Excellence, Magama da Costa Health Center, Catembe Health Center, Berea Hospital, and Makiwane Hospital. The 'Layers' panel on the right lists various themes: ICAP Sites (checked), Active Sites, Closed Sites, Planned Sites, Cities, Major Rivers (checked), Major Lakes (checked), National Boundaries (checked), Provinces/Divisions, Road Network, Demographic Health Sur, Urban-Rural Extents, Elevation (SRTM), and ICAP Countries (checked). The map shows coordinates X: 15.3917 and Y: 35.8599, and a scale of 1: 47790941. A 'Tools' panel is visible on the left, and a 'FEATURE INFO' panel is at the bottom left.

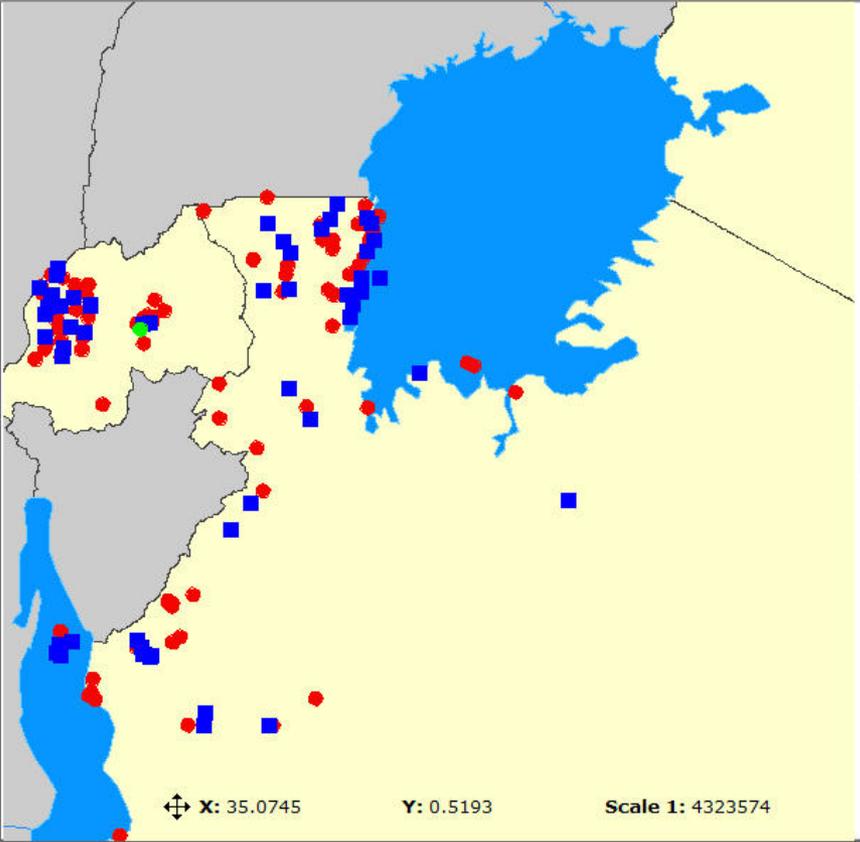
# Site Census

**ICAP** International Center for AIDS Care and Treatment Programs  
MAILMAN SCHOOL OF PUBLIC HEALTH Columbia University

Simple Advanced

Theme Site Census | Area - Select Below | known

issues



X: 35.0745 Y: 0.5193 Scale 1: 4323574

**Layers**

- ICAP Sites
- Closed Sites
- default
- MISSING LEGEND
- Planned Sites
- default
- MISSING LEGEND
- Active Sites
- default
- MISSING LEGEND
- Cities
- Major Rivers
- default
- MISSING LEGEND
- Major Lakes
- default
- MISSING LEGEND
- National Boundaries (ou
- black\_line
- MISSING LEGEND
- Provinces/Divisions
- Road Network
- Demographic Health Sur

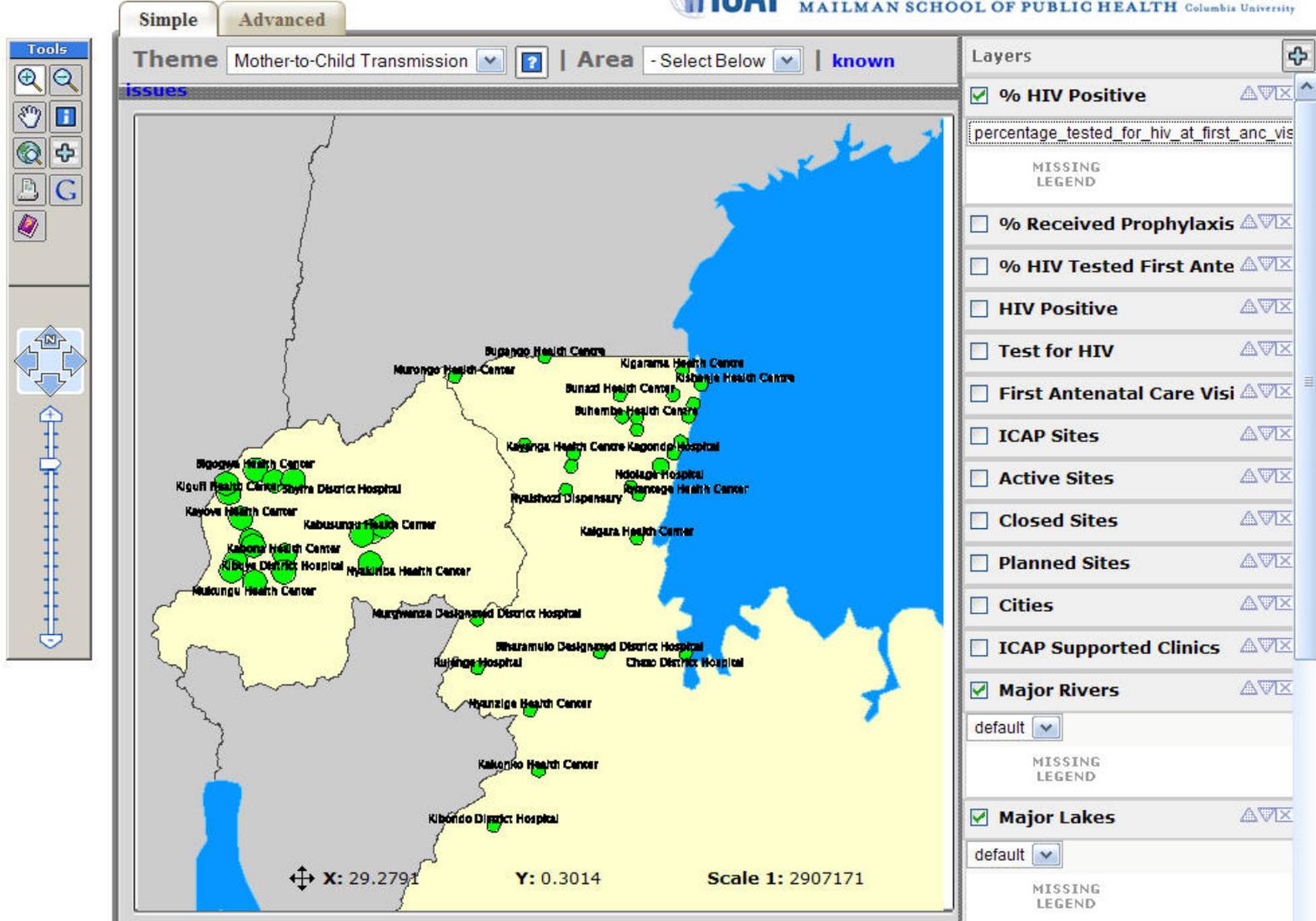
If your map isn't displayed, try reloading the page.

**FEATURE INFO**

Key:  
= Draggable Item



# Percent HIV tested



# Context Files and OGC Layers

The image displays a web GIS application interface for ICAP (International Center for AIDS Care and Treatment Programs) at the Mailman School of Public Health, Columbia University. The main map shows Ethiopia with various health centers marked as green dots and labeled, such as Biqango Health Centre, Kijfuna Health Centre, and Kibera Health Centre. The application has a 'Theme' dropdown set to 'Mother-to-Child Transmission' and an 'Area' dropdown set to 'Ethiopia'. A 'Layers' panel on the right lists several layers, with '% HIV Positive' checked. A 'Tools' panel is visible on the left. In the foreground, a 'Add New Layer' dialog box is open, showing options to 'Add a New Service' (Web Feature Service), 'Upload a File' (GML), or 'Filter an Existing WFS Layer'. The dialog includes fields for 'Select URL', 'Or Enter URL', 'File Name', and 'SRS' (EPSG: 4326). The dialog is titled 'http://beta.www.ciesin.columbia.edu - Add New Layer - Mozilla Firefox'.

# Observations on unified reporting system

- Has been generally helpful to unify reporting from various program realms under one system
  - Need to balance the desire to standardize with flexibility across and within countries
  - Requires buy-in and participation from clinical staff and program managers
- Improves data quality
- Does not obviate the need for more complex data bases, locally developed and maintained
  - These will become increasingly common and there will be a need to avoid duplicate data entry
- Holds great potential to assist and inform implementation activities
- Is scalable to many sites and programmatic activities, perhaps even nationally
  - Some ministries have expressed interest in adapting the site-census, PFaCTS, and GIS tools for their national programs

## SEDAC Mapping Client

<http://sedac.ciesin.columbia.edu/mapviewer/index.jsp>

## ICAP Map Viewer

<http://beta.www.ciesin.columbia.edu/icap/mapviewer/>

Thank You !